A STUDY OF REMAINDER PARCELS RESULTING FROM THE ACQUISITION OF HIGHWAY RIGHTS-OF-WAY

PART I - ANALYSIS

SEPTEMBER, 1963

NO. 22

by

V.G. STOVER

Joint Highway Research Project

PURDUE UNIVERSITY
LAFAYETTE INDIANA

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Final Report

A STUDY OF REMAINDER PARCELS RESULTING FROM THE ACQUISITION OF HIGHWAY RIGHTS-OF-WAY

TO: K. B. Woods, Director
Joint Highway Research Project

September 27, 1963

FROM: H. L. Michael, Associate Director
Joint Highway Research Project

File No: 3-5-5
Project: C-36-64E

Attached is a Progress Report on the Highway Impact Studies project but it is also a Final Report for that project of the Indiana sample of Case Studies of R/W Takings, a phase of that study. The report has been prepared by Mr. Vergil Stover, a Research Assistant on our staff and it is titled " A Study of Remainder Parcels Resulting From the Acquisition of Highway Rights-of-Way". The research has been performed by Mr. Stover under the direction of Professor H. L. Michael and Mr. Stover has also used the report as his thesis for the Ph.D. degree.

The findings of this research, although based on a limited number of case studies, provide data by which more equitable treatment can be given to those involved in a R/W taking and also indicates ways in which the state can save money. The procedures developed in this research are currently being used by a new section within the R/W Division of the Highway Commission and the research is to be continued within that department. Mr. Stover during the summer of 1963 assisted in the development of this new section within the Highway Commission.

The report is presented for the record. It is two parts with the second part being the case studies.

Respectfully submitted,
Harold L Michael/BC

Harold L. Michael, Secretary

HLM:bc

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Final Report

A STUDY OF REMAINDER PARCELS RESULTING FROM THE ACQUISITION OF HIGHWAY RIGHTS-OF-WAY

by

Vergil G. Stover
Research Assistant

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Not Reviewed By

Indiana State Highway Commission
or the
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Joint Highway Research Project
File No: 3-5-5
Project No: C-36-64E

in cooperation with
Indiana State Highway Commission
and the
Bureau of Public Roads
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ACKNOWLEDGMENTS

The author wishes to express his thanks to H. L. Michael, Professor of Civil Engineering and Associate Director of the Joint Highway Research Project for his role as major professor. His guidance, stimulation, and assistance throughout the entire program of study are most sincerely appreciated.

Thanks are also extended to Mr. Raymond Bower and Mr. Frank Renner of the Division of Land Acquisition of the Indiana State Highway Commission for their helpful suggestions at various times in the course of the conduct of this research.

The research was conducted under the auspices of the Joint Highway Research Project, Purdue University in cooperation with the Bureau of Public Roads and the Indiana State Highway Commission. The financial support of these agencies is gratefully acknowledged.

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ABSTRACT

Stover, Vergil G., Ph. D., Purdue University, June 1963. A Study of Remainder Parcels Resulting From The Acquisition Of Highway Rights-of-Way.

This research is concerned with the case histories of several remainder parcels that resulted from a highway right-of-way acquisition by the Indiana State Highway Commission between 1 January 1955 and 31 December 1961. The several right-of-way projects were divided into two groups -- interstate routes and primary or secondary routes. Sample projects were then randomly selected from these two populations and all remainder parcels included therein were investigated. In all, 2,300 individual remainder parcels were investigated; 46 of these subsequently resulted in a case study. Of these, 16 were on primary or secondary routes and 30 were on interstate routes.

The collection of case studies was then analyzed. It was found that the remainders on the primary and secondary routes and on the interstate routes sold for a total amount that exceeded their 'after' value. However, for both populations, relatively few remainders were greatly enhanced.

Analysis of the damages paid and sustained was also made. These results indicated that the total of the damages paid exceeded the total damages sustained for the state as a whole. However, of more significance was the fact that many property owners received sizeable over payments for damages while others suffered uncompensated damages.

Analysis of overpayment of damages was also made for landlocking, separation, and reduction in size.

INTRODUCTION

The intent of the condemning authority in a right-of-way acquisition is that the property owner receive fair compensation for the part taken as well as for any damages incurred by the residual. In other words, the 'before' value of the property less the amount of the settlement should equal a sum that is neither more nor less than the market value of the residual. This presupposes that both the market value of the parcel at the time of acquisition and the extent of the damages to the remainder can be accurately estimated.

To this end, there has been a noticeable effort made to improve the appraisal process and administrative policies. The employment of more competent fee appraisers and a continued increase in the requirements which their appraisals must meet has had considerable effect in the past four or five years. The initiation of a training program and establishing staff appraisers on a professional level in Indiana can also be expected to result in further improvements.

Various modifications in techniques to improve the appraisal process in conjunction with partial takings have been proposed in recent years. Some of these deal with approaches to proximity damages (8)*, loss of access (10), interim land use (12), etc. The appraiser has also been supplied with the results of a number of investigations which endeavored to identify and evaluate the factors which affect property values, both urban and rural.

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* Numbers in parentheses refer to entries in the Bibliography.

A large number of research projects have been undertaken to study the effect of a highway improvement on property. The early investigations initiated in the various states were primarily a micro-analysis of highway improvements. That is, they were a study of the broad effects of the impact of a particular improvement, such as an urban by-pass on the community and/or the immediate area through which the facility passed. Those studies completed, as well as others in progress, are massing a wealth of information useful to the planning and location engineers, right-of-way personnel, and the officials of the urban community. They provide the appraiser with information that will aid him in his estimation of the probable gross effects of the improvement on adjacent land value and land use. They do not, however, supply him with specific information concerning the damages to individual parcels.

Land Economic Studies

The absence of documentary data on the individual histories of various types of residual tracts has placed the right-of-way appraiser very much "on his own" in the estimation of damages. Such limited notes as an individual appraiser may have collected through his professional experience are not readily available to his fellow appraisers, nor are they available as a negotiation tool to the right-of-way buyer.

With a lack of commonly available information to the contrary, it is not surprising that property owners, juries, and the general public have perhaps developed an attitude that substantial damages are sustained by residual parcels. This generalization is periodically reinforced by the

awards of trial courts - most often without a mention of any possible benefits to the residual. These awards then "feed back" into the appraisal process.

Consequently, attention has been recently focused on the need for a micro-analysis; that is, a case study approach to the investigation of individual remainder parcels. This type of research holds the promise of supplying the maximum amount of information directly applicable to the practicing appraiser in the shortest possible time. The uses which might be made of such research findings are quite broad - varying from general public relations to the estimate of damages applicable to a particular remainder parcel.

The possibilities of a concentrated effort in the often neglected area of public relations is particularly challenging. The general distribution of short summaries of individual case studies, as well as a summary of the results of the aggregate analysis of several case studies, offer the possibility of informing the public of the true nature and extent of severance damages. It could also develop a public awareness, that under certain conditions, the construction of a new improvement actually enhances the residual. This could have far-reaching effects since it is, in the end, the public that pays the bill for the right-of-way, serves on the jury in condemnation trials, and is the owner of property from whom we must acquire the necessary land.

Review of Literature

Studies of remainder parcels are presently being conducted in a number of states. It appears that a large portion of the case studies to date resulting from these investigations concern remainders which are

probably rather atypical. In many cases, they are residuals which are located adjacent to interchanges near a metropolitan area. Others are landlocked or severed parcels against which substantial damages were assessed and paid. These properties most often sold for prices considerably in excess of their apparent 'after' value (the 'before' value less the amount of the settlement).

A paper presented at the 39th annual meeting of the Highway Research Board (6) presented data concerning eleven residual parcels in the State of Oregon. On the basis of payment for the part taken and for damages, only one parcel apparently suffered uncompensated damages. In the ten other situations, the sale price exceeded the 'after' value. Indeed, there were apparently no damages sustained by these residuals although payments for damages were made in six of the cases.

These data indicated that damages often do not exist and, that in some cases, there are even enhancements. They do not, however, give any indication as to the relative frequency of these occurrences.

The results of an analysis of approximately 400 case studies reported to the Bureau of Public Roads (15) reveal that sizeable increases often occur in the value of remainder parcels. Of the 170 cases where the entire residual was sold, only 28 suffered any damages while 26 reflected an increase in value of 100 percent or more. These analyses indicated that if no damages had been paid, the property owners would have, on the average, received at the 'after' sales nearly 190 percent of the 'before' values of these residual tracts.

The percentage increase of the 'before' value differed for the various land uses - varying from an average increase of nearly 140 percent for

agricultural land, to about 70 percent for idle land, and to slightly less than 20 percent for residential property.

Remainders that were fully visible from a new highway increased by over 130 percent in value where the highway was on new location and 110 percent where the facility was located on an existing alignment. Properties that were not visible increased by less than 5 percent and less than 10 percent for highways on new and existing locations respectively.

A report by Buffington and Adkins (1) of the Texas Transportation Institute presents the results of a study of all remainder parcels along a portion of Interstate 820 at Fort Worth. This appears to be one of the few researches reported to date from which inferences as to the frequency and amount of damages or enhancements can be made.

The report contains 25 case studies that resulted from the 676 parcels involved, as well as an aggregate analysis. The results indicated that damages were paid in six cases where no damages were sustained and that damages paid exceeded damages sustained for six additional remainders. There was one residual that sustained damages where none were paid.

It was also reported that only one of the residuals which sustained damages later succeeded to a higher land use. In contrast, of the 13 parcels which were enhanced, seven had changed to a higher use by the date of the study. Two of these enhanced residuals were sold twice, but both appeared to have been damaged on the basis of the first sale price.

The research conducted in the study reported herein was undertaken as part of an economic research study in the State of Indiana. The intent of this research was to supply information on the effect of Indiana's highway improvements, especially data that would be directly applicable to the

Divisions of Planning and of Land Acquisition of the Indiana State Highway Commission.

This report is concerned with studies of partial takings. The data collected are arranged in case study form as Appendix A; procedures for continuing studies are included as Appendix B. It is hoped that the data contained herein will be, to some degree, immediately useful and that it will point out the type of information which can be obtained by further research.

The use of these data in legal proceedings is very ably presented by Mr. Sidney Goldstein of the Bureau of Public Roads in his paper entitled "Economic Evidence in Right-of-Way Litigation" in Public Roads, Vol. 32, No. 2, June 1962. Therefore, this application will not be expanded in this report.

STUDY OBJECTIVES AND SCOPE

The particular items of interest or analytical objectives of this research were:

- a comparison of damages paid and sustained
- an indication of the amount (dollar value) of excess damages, if any, paid
- under what conditions may damages be expected to be less than (or more than) currently appraised
- the frequency with which sizeable enhancements, if any, occur
- under what conditions or in what situations do these enhancements result
- what is the percent damages sustained (or enhancements received) for various types of residuals

A basic consideration, as is implied by the analytical objectives, was that results should not only be applicable to the parcels studied but that any conclusions and/or inferences as might be drawn would be relative to the State of Indiana as a whole. Consequently, it was decided to utilize a statistically selected sample. This sample was selected (as explained in the procedures) from projects placed under contract between 1 January 1955 and 31 December 1961. Projects dating prior to 1955 were not utilized for two reasons: 1) seven years was expected to be, or even exceed, the maximum time span for which data could be effectively obtained; 2) appraisals of only the part taken were documented prior to 1957 and those made before 1955 were considered to be quite "weak". No projects placed under contract after 1961 were included as the major portion of the data collection was scheduled for 1962.

PROCEDURE

Selection of Study Sites

All right-of-way projects placed under contract by the Indiana State Highway Commission between 1 January 1955 and 31 December 1961 were divided into two populations - either interstate or primary and secondary routes - and each project was assigned a number. It was decided that a separate sample should be obtained for each of these populations. A table of random digits (11) was then utilized to randomly select a sample of 31 projects from the population containing the 99 interstate projects and a sample of 35 from the population comprised of the 430 projects on primary and secondary routes. The total of 66 projects selected was determined to be all that the personnel available could handle in the period of the study.

This procedure insured that a relatively large number of interstate projects would be studied. If this technique had not been employed, the expected number of interstate projects in the sample would have been, of course, in proportion to the number of interstate projects in the total number of projects. Thus, a sample of 66 projects selected randomly from the total of 529 projects would have been expected to include only twelve interstate right-of-way projects. The interstate facilities, however, were of special and current interest and it was felt that a larger sample was desirable.

A possible disadvantage of this decision, however, was that for a given number of projects to be studied, a smaller number would be drawn

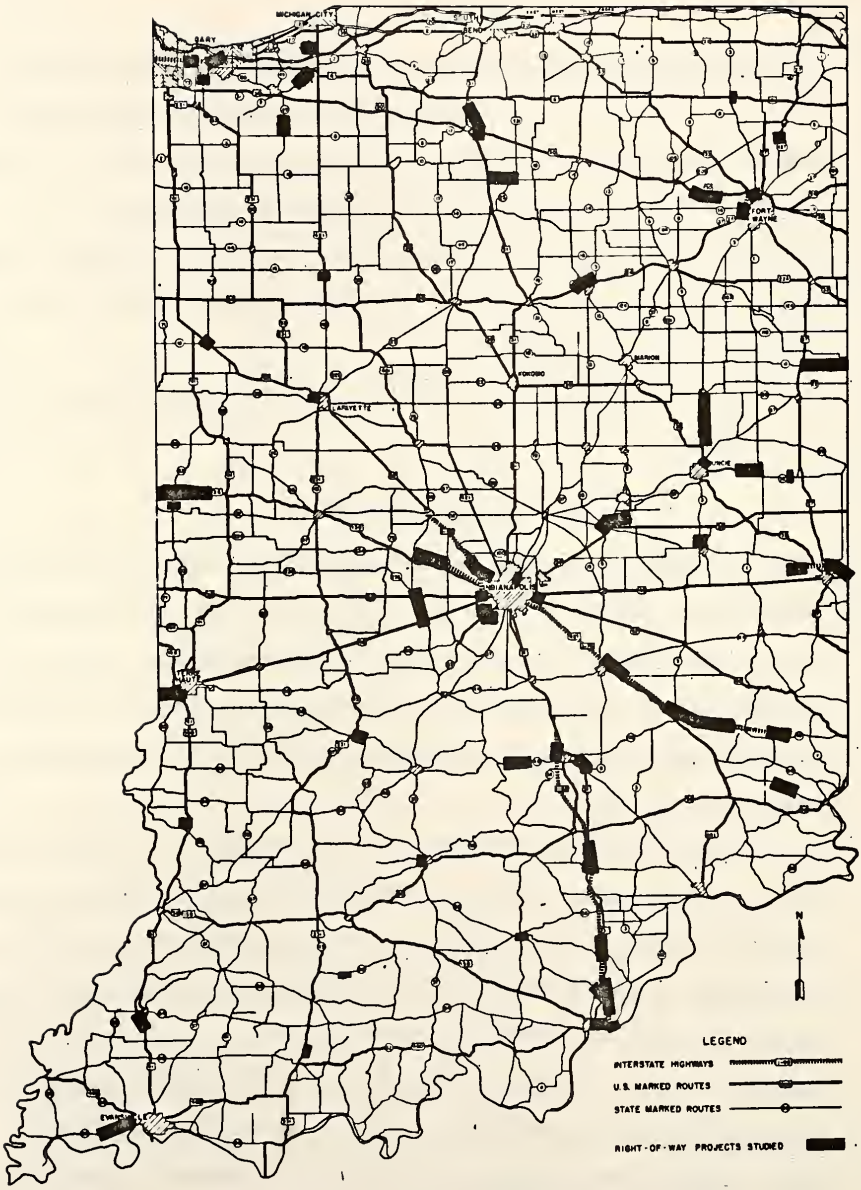
from the primary and secondary routes. Consequently, less information would be available for this population. This procedure also required that any inferences made for the State of Indiana as a whole had to be made with respect to these same two populations. That is, any estimate as to the total dollar value of damages sustained versus the total dollar value of damages paid had to be made for the interstate routes and the primary and secondary routes separately.

Figure 1 indicates the location of the right-of-way projects involved in the samples.

Data Collection

Following the selection of sample projects, strip maps (when available for a project) and/or the names of all property owners involved were obtained from the Division of Land Acquisition. A thorough search of the records was then made at the county seat of the respective counties to determine which, if any, properties had changed ownership since the right-of-way appraisals were made.

Initially, this check to determine if a transfer of title had occurred was made by reference to the plat books and transfer books in the county auditor's office. In some instances, these records were found to be poorly arranged and rather difficult to use efficiently. In most cases, it was found to be faster to check the General Index of Deeds by grantor in the recorder's office in order to determine if the particular remainder parcels had been sold in the time period following the right-of-way appraisal. In Lake, Marion, and Vanderburg Counties, the more efficient procedure was, however, to use the transfer records in the auditor's office. A copy of the deed, including the amount of U. S. Revenue Stamps, the amount of Indiana



LOCATION OF RIGHT-OF-WAY PROJECTS INVOLVED IN THE SAMPLE

FIGURE 1

Gross Income Tax paid and the date of instrument was generally obtained for each tract sold.

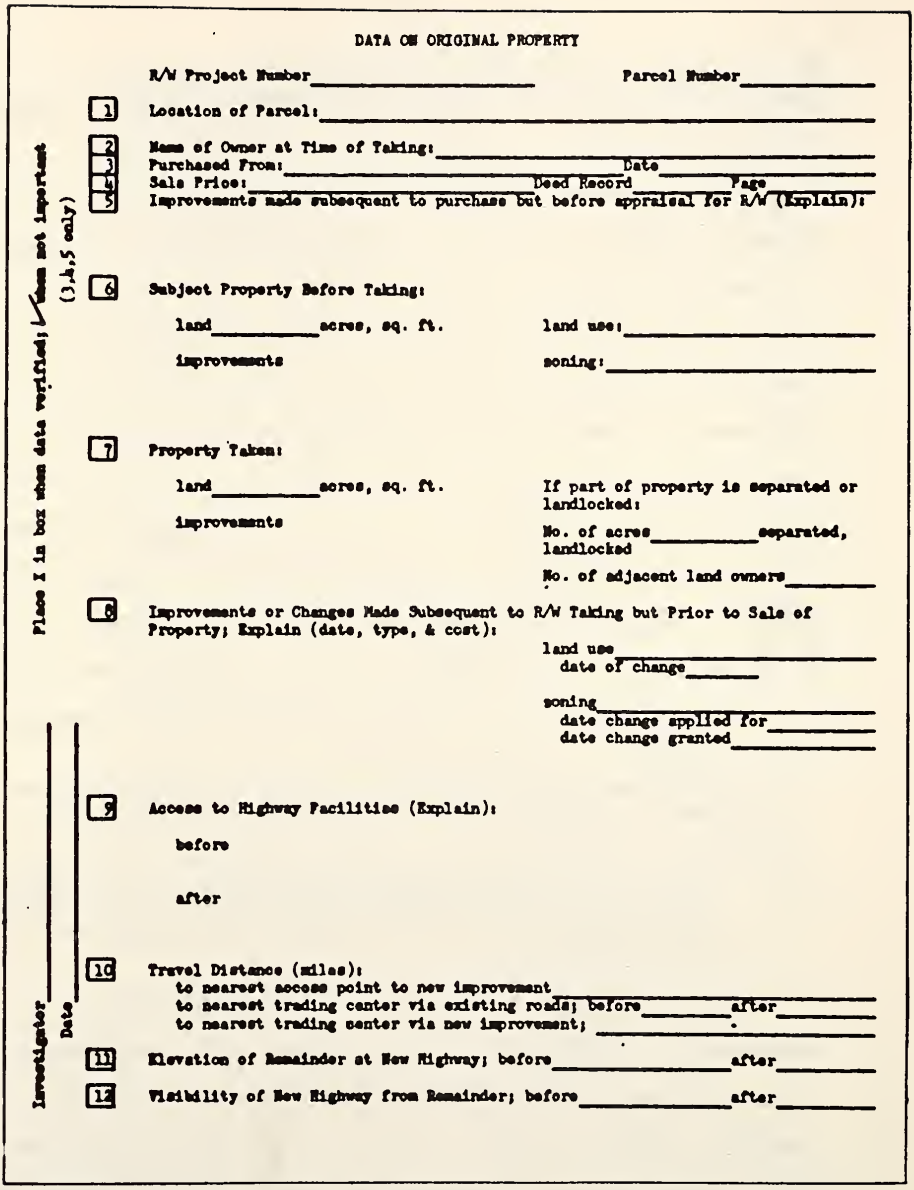
At the beginning of the studies, verification of the sale price was attempted. This was done by interviewing either the grantor or grantee on the first trip to the area. Other supplementary information relative to the subject property and the portion sold, as well as changes in the general level of real estate prices, was also obtained at this time. However, in many cases, this resulted in the expenditure of considerable time in collecting data on parcels that would not result in a case study. In other instances, certain questions arose concerning the subject properties after the right-of-way files had been studied in detail. For these reasons, an additional trip was often necessary to clarify these questions. Consequently, it was found to be more efficient to utilize the following procedure:

1) Check for transfers of title involving the subject properties on the first visit to an area.

2) Study the right-of-way files in detail for those parcels which had been sold and prepare as much as possible of report.

3) Make a second trip to the area and verify the sale price and clarify any questions concerning the parcel(s). Any additional information necessary such as distance to the nearest shopping center, zoning, land value control information, etc. were also obtained at this time.

The forms presented in Figures 2 and 3 were developed as an aid in interviewing the grantee and/or grantor as well as to insure that all information necessary was obtained. The data called for on the forms were completed, insofar as possible, prior to the interview and the items were simply checked off as the information was verified by the property owner. It was general practice to verify the information obtained from the right-of-way file (including the total number of acres owned and taken, the



DATA ON ORIGINAL PROPERTY

R/W Project Number_____ Parcel Number_____

Place X in box when data verified; ✓ when not important (3,4,5 only)

1 Location of Parcel:_____

2 Name of Owner at Time of Taking:_____

3 Purchased From:_____ Date_____

4 Sale Price:_____ Deed Record_____ Page_____

5 Improvements made subsequent to purchase but before appraisal for R/W (Explain):

6 Subject Property Before Taking:

land_____acres, sq. ft. land use:_____

improvements zoning:_____

7 Property Taken:

land_____acres, sq. ft. If part of property is separated or landlocked:

improvements No. of acres_____separated, landlocked

No. of adjacent land owners_____

8 Improvements or Changes Made Subsequent to R/W Taking but Prior to Sale of Property; Explain (date, type, & cost):

land use_____
date of change_____

zoning_____
date change applied for_____
date change granted_____

9 Access to Highway Facilities (Explain):

before

after

10 Travel Distance (miles):
to nearest access point to new improvement_____
to nearest trading center via existing roads; before_____after_____
to nearest trading center via new improvement; _____

11 Elevation of Remainder at New Highway; before_____after_____

12 Visibility of New Highway from Remainder; before_____after_____

Investigator_____ Date_____

FORM FOR THE COLLECTION OF DATA RELATIVE TO THE ORIGINAL PROPERTY

FIGURE 2

DATA ON RESIDUAL PROPERTY

R/W Project Number_____ Parcel Number_____

Grantor_____ Grantee_____

1 Address_____ Address_____

2 Date of Instrument_____ Deed Record_____ Page_____

3 Are Grantor & Grantee Relatives? __no; __yes, relationship_____

4 Property on Date of Instrument: Area_____ acres, square feet
improvements

5 Description of Changes in Improvements Since Date of Instrument:

date completed	type of improvement	size	cost $

Place X in box when data verified

6 Land Use:
before sale_____; after sale_____

date of change_____

7 Anticipated Future Use of Property:

8 Zoning:
before sale_____; after sale_____

date of application for change_____ date granted_____

9 List Utilities Available to Property (✓ available on date of sale; X if added after):
gas___, city water___, well___, electricity___, sewer___, septic tank___

10 Access to Part Sold:

11 Sale Price:

$ Stated	$	US Revenue Stamps: stamps	inferred price to $	Ind. Gross Income Tax: $ tax	inferred price $

Investigator_____ Date_____

12 Description of Terms of Sale (mortgage assumed, land contract, etc.):

13 If Rental Property: rental rate $_____ per month

14 If Only Part of Residual Sold: elevation_____ and visibility_____
of part sold from new highway

15 Photographs Taken (date):

FORM FOR THE COLLECTION OF DATA RELATIVE TO THE REMAINDER PARCEL

FIGURE 3

improvements taken and remaining, and the size of any severed or landlocked tracts). In some cases, discrepancies were found between the data in the files and the property owner's statements. In most instances, these were differences in the number of acres severed or landlocked as determined by a survey made in conjunction with the sale of the residual or a part thereof. In some cases, farmers stated that they owned nearby or adjacent acreage which was not included in the 'before' appraisal.

In addition to being a convenient manner by which to insure that all the necessary information was acquired, the forms shown in Figures 2 and 3 were found to be a very useful tool in getting the property owners "to talk". The fact that they had answered several minor questions and noted their answers as recorded on the forms before they were asked if they would be willing to state the sale price greatly improved the response to this question.

Unless a specific statement is made to the contrary, the sale price used in this study is that price stated by the grantee and/or grantor. The grantee was generally contacted first because he was usually easier to locate.

In the few instances where a stated sale price was not available, the sale price was inferred from the amount of Indiana Gross Income Tax paid and recorded on the deed. When this information was not available (all sales before 1 July 1960), the amount of U. S. Revenue Stamps, plus the balance of any outstanding mortgage assumed, was utilized.

'Before' Value of Property

When the subject property was sold just prior to the right-of-way taking, this sale price was taken as the 'before' value. In the vast

majority of cases, however, the property had not recently passed through the real estate market; in such cases the appraisals made in conjunction with the right-of-way acquisition were utilized. Generally, this resulted in the 'before' value being an average of two fee appraisals.

Presumably these two appraisals were independent estimates of the true 'before' value. However, in the process of reviewing the appraisals utilized, it became quite apparent that in many instances the appraisals were not entirely independent of each other. In these situations, it must be assumed or at least hoped, that such collusion as occurred in the process of the preparation of these appraisals led to what is essentially a single estimate of the 'before' value that is the "best" available.

It also became apparent that in all probability the appraised values were, on the average, somewhat inflated. One reason for suspecting this bias is that in some instances the appraisals of land exceeded the highest reported selling price of similar property in the locality. The other reason is the statement made by some appraisers that they in general appraise a property involved in a right-of-way acquisition at a conservatively high value rather than at what might be termed a "best" estimate of true value.

The question naturally posed by the use of appraised values as 'before' values is: how closely does the average appraised value approximate market value? This question might be answered by research designed to analyze the comparison of appraised values with sale prices for a large number of properties. Such a study would, of course, have to be concerned with properties not involved in a right-of-way taking and was beyond the scope of this research.

It is suspected that in the case of improved farm property, the appraisal method which utilizes appraisal of land plus the depreciated value of

the improvements often yields an estimated value that is in excess of the property's market value as a farm unit. This hypothesis is based on the fact that the trend is towards large farm units and that many of the grantees already have a homestead. The comparison of sale price, asking price, and appraisals of unimproved land and improved properties with poor to excellent improvements tends to substantiate this. In many cases where the grantee already owned an improved property, his non-use or demolition of some of the improvements on the land purchased indicates that he considered them to have little value.

An estimate of value based on the value of the land plus the depreciated value of the improvements was available for each parcel involved in a right-of-way taking. In a very few cases, an appraisal was also made utilizing the market and/or income approach as well. In these instances, the 'before' value used was, of course, that value which the appraiser specified as his best estimate of fair market value.

However, in some cases, the appraisals made in conjunction with the right-of-way acquisition deviated very greatly from what appeared to be 'before' market value. Indeed, in a few cases, they differed considerably from the appraised unit value of nearby comparable parcels on the same project. For five of these parcels that finally resulted in a case study, the appraisals were revised or reappraisals made. The case studies for which this was done are as follows:

Case Study	Appraised 'Before' Value	Revised 'Before' Value
21	$ 800	$5,000
22	18,166	16,790
26	8,000	6,000
31	435	1,740
33	7,350	4,900

These revised 'before' values were made only after considerable data had been collected on the subject property as well as similar properties in the vicinity. Therefore, since these revisions were made "after the fact", they are not necessarily held to be the estimates of fair market value which could have been made at the time of the appraisal. However, it is believed that they are more nearly representative of the 'before' values which should have been approximated.

Whether in a review of a particular case study or the analysis of a collection of case studies, the probable bias of the 'before' values utilized as well as the possible sources of this bias must be recognized. Even though the value utilized in some of the cases of this study may not be the "best" estimate of the fair market value, it was the best estimate available.

A word of optimism might well be added at this point. In reviewing the appraisals used herein, made over the course of the past few years, one thing became abundantly clear--namely, the quality of the appraisals has been improving very rapidly.

Discussion of Methods of Employing Land Value Control Data

In some instances, there may be doubt as to real estate price trends between the time of the right-of-way taking and the date of sale of the residual; in others, it may be known that the local market has changed substantially. In all situations, it is necessary to separate the normal changes in property value from the possible affects of the highway improvement.

Market data might be employed in two different ways in an attempt to evaluate such changes in the local real estate market.

One method is to utilize the market approach to value by appraising the residual, as of the date of sale, as a whole parcel with no effect due to the new highway improvement. A comparison of this appraised value (preferably the average of at least two independent appraisals) with the sale price would indicate if the residual was enhanced, damaged, or unaffected by the new facility. The other method is to compare market data at the time of taking with market data at the time of the sale of the residual. A comparison of these two median values (or mean values when they are more reliable) would presumably indicate if a change in the market has occurred. If a change in real estate values is indicated, the average of the appraisals made at the time of taking might be adjusted by the indicated percentage and this adjusted appraised value compared to the sale price. Both of these procedures involve certain assumptions and have their particular advantages as well as disadvantages.

The first method compares the sale price with that "price" for which the residual would presumably have sold if there were no special benefits or damages to the parcel due to the new highway. This comparison involves the following assumptions:

- the comparable property(s) on which the appraisal is based is truly comparable, or the adjustments made accurately represent the differences between the comparable(s) and the subject property and that these are the only differences which exist (except, of course, differences due to the new improvement and for which an adjustment would not be made)

- and following from the above: any difference between the sale price and this appraised value of the residual is due to the special benefits or damages of the new improvement.

A primary advantage of this method is that no reliance need be placed on the appraised value of the property as it existed prior to the right-of-way

taking. This is particularly important in the case of the older appraisals where the methodology used to estimate the 'before' value was of poor or doubtful quality or where there is reason to believe this appraisal was inflated or otherwise subject to question. However, this advantage will diminish to a considerable degree as more competent appraisers are employed and the appraisal techniques are improved.

The disadvantage of this method is primarily one of cost. The Division of Land Acquisition estimates that their fee appraisers charge, in general, between $100 and $150 per appraisal. At, say, $125 each, this would involve an expenditure of $250 per case study.

The second method of analysis involves the comparison of the sale price of the residual to its remainder value (i.e. the appraised 'before' value less the amount paid - not including damages - for the property taken). If a price change has occurred in the local real estate market, the comparison is made between the sale price and the remainder value adjusted for this change - the percentage change being obtained from the comparison of real estate prices in the 'before' and 'after' periods of comparable properties. The assumptions involved are:

- that all property (of a similar type and land use as the subject property) in the vicinity changed by the same percentage.
- that the appraised 'before' value (generally the average of two appraisals) is an unbiased estimate of the true 'before' value.

An advantage of this procedure is cost as each residual need not be appraised as of the date of sale. Control information need only be obtained in those instances where a change in the local market might have occurred. Also the requirements concerning the comparability of the control parcels to the subject parcel may be relaxed somewhat; this, however, must be done with caution.

The main disadvantage is, of course, that an unbiased estimate of the 'before' value is required. However, it can be anticipated that this disadvantage will decrease substantially, if not eliminated, as the quality of the appraisals are improved through better techniques and practices, as well as more qualified personnel.

Collection and Use of Control Data

In each case where a period of about one year or more had elapsed between the time the appraisal(s) was made and the date of sale of the residual, an attempt was made to determine the local real estate trends for the type of property involved. Similar properties situated outside the immediate influence of the new highway and which had been sold within three months of the date of the appraisal or the date of sale of the residual were used for this purpose. In no case were sales utilized which occurred more than five months from either of these dates.

When collecting sales data on rural properties, the county agricultural agent was first contacted. This source was generally able to supply information as to which sections are of a similar soil type, productivity, farming operation, etc., as well as approximate land values and the location of some properties which had been sold. A complete check of the county transfer books and/or general index of deeds was then made to determine which properties situated in these sections had been sold within the time periods of interest. Only properties located within six miles of the subject parcel were utilized in the analyses.

Various realtors, appraisers, and attorneys were then approached in order to verify sale prices and to obtain such supplementary data as they might be able to supply. The individual property owners were not contacted

unless the information could not be obtained in a less time-consuming and expensive manner.

In the case of urban property, only similar properties located in the same or similar and adjacent neighborhoods were utilized. The records provided through a member of a multiple listing service were used to obtain the control data when possible. These records were, of course, a convenient source of information and provided considerable data in a relatively short time, especially when the sale price had been recorded on the listing and were filed by the location. In other situations where this source was not available, the names of appropriate subdivisions were obtained and a procedure similar to that for rural property was followed.

There were only two instances where a property which was similar to the subject parcel sold both at the time of the appraisal and at the time of the sale of the residual. Therefore, it was necessary to use different properties in the 'before' and 'after' periods.

Because of the small number of sales generally involved, the use of the median, rather than the mean, more closely represents the central tendency of local real estate prices. The change in price over the time interval of interest was therefore measured by comparing the median price in the period in which the residual parcel sold to the median price in the period in which the appraisal of the subject parcel was made.

Data Collected

The data collected for this study is contained in 46 case studies which are included in Appendix A of this report.

DETAILED ANALYSIS OF CASE STUDIES

The small number of case studies included in this report precluded an extensive statistical analysis with respect to specific classifications, or types, of remainders. However, certain gross comparisons were made for each of the two populations (interstate projects or primary and secondary projects) into which all projects were divided.

A total of 1,049 remainder parcels were involved in the 35 right-of-way projects on primary and secondary roads. Change in title was recorded for 165 of these residuals or portions thereof by 1962. Sixteen or 1.5 percent of all remainders resulted in a case study.

The 31 projects on interstate routes involved a total of 1,258 parcels. Title to 105 of these, or portions thereof, had been transferred by 1962 as determined from county records. A total of 30 case studies resulted; this is about 2.4 percent of the total number of residuals involved.

The fact that 'before' values were not available for the vast majority of remainders prior to 1957 was the main reason for the low percentage of case studies that developed from the remainders on primary or secondary routes. In a number of instances on both interstate routes and primary and secondary routes, a case study did not result because only a very small portion of the remainder sold. In addition, a large portion of the sales of remainders failed to develop into a case study because the transfer of title was between kinfolk. Finally, some case studies were "lost" because major pieces of data were missing. This usually resulted where the residual sold

even though the parcel was still involved in a condemnation proceeding and/or important data could not be obtained or verified; this problem was more serious for residuals resulting from a taking for an interstate highway.

Comparison of 'After' Value and Sale Price

A comparison of the 'after' value (appraised 'before' value less the amount of the settlement) with the sale price was made for each residual parcel. These data are shown in Table 1 for the residuals resulting from a primary or secondary road project and in Table 3 for those resulting from an interstate route. These values have not been adjusted for any change in the price of real estate that may have occurred between the appraisal of the 'before' value and the date of sale. The data shown in Table 2 (primary and secondary) and Table 4 (interstate) have been adjusted for such changes in price as reflected by the local real estate market through the sale of similar property. In these cases where a change was indicated, the median sale price of similar property at the time of sale of the residual is shown as a percentage of the median price at the time of the respective appraisal. Therefore an entry of, for example, 110 in the column headed "Adjustment to Date of Sale" indicates that this type of property, in the particular area, experienced a ten percent increase in price in the time period in question. A summary of the data upon which these adjustment factors were based is included in the respective case study (see Appendix A).

A further difference between Tables 1 and 2 or Tables 3 and 4 is that a revised 'before' value for the parcels involved in case studies 21 and 22 are utilized in Table 2 and for case studies 26, 31, and 33 in Table 4. These revisions are summarized in Table 5 and each revised 'before' value is discussed in the pertinent case study in Appendix A.

TABLE 1

COMPARISON OF SALE PRICE AND 'AFTER' VALUE OF PARCELS INVOLVED IN PRIMARY AND SECONDARY ROAD PROJECTS

Case Study No.	Analysis of Part Sold	'Before' Value $	Amount of Settlement $	Apparent 'After' Value $	Sale Price $	Difference $	Difference %
14	total residual	19,490	18,884	606	2,500	+ 1,894	+ 313
16	landlocked 0.61 acre	610	570	40	750	+ 710	+1,775
17	total residual	18,906	2,513	16,393	35,000	+18,607	+ 114
19	total residual	8,100	3,200	4,900	3,500	- 1,400	- 29
20	total residual	23,392	711	22,681	35,000	+12,319	+ 54
21	2 acres	800	393	407	35,000	+34,593	+8,500
22	total residual	18,166	15,997	2,169	900	- 1,269	- 60
23	total residual	15,400	4,100	11,300	12,500	+ 1,200	+ 11
24	total residual	7,500	512	6,988	10,100	+ 3,112	+ 45
27	total residual	9,100	400	8,700	12,500	+ 3,800	+ 44
41	total residual	19,750	11,047	8,703	13,500	+ 4,797	+ 55
45	total residual	14,790	727	14,063	13,000	- 1,063	- 8
46	total residual	19,600	941	18,659	14,600	- 4,059	- 22
47	1.5 acres	12,780	7,025	5,755	7,000	+ 1,245	+ 22
55	all residual land	98,310	9,485	87,825	101,200	+13,375	+ 15
61	total residual	5,400	623	4,777	6,500	+ 1,723	+ 36
	Totals	292,094	77,128	213,966	303,500	89,584	

TABLE 2

COMPARISON OF SALE PRICE AND THE ADJUSTED 'AFTER' VALUE OF PARCELS INVOLVED IN PRIMARY AND SECONDARY ROAD PROJECTS

Case Study No.	Apparent 'After' Value $	Adjustment to Date of Sale %	Adjusted 'After' Value $	Sale Price $	Difference $	Difference %
14	606	no adjustment	606	2,500	+ 1,894	+ 313
16	40	no adjustment	40	750	+ 710	+1,775
17	16,393	no adjustment	16,393	35,000	+18,607	+ 114
19	4,900	no adjustment	4,900	3,500	- 1,400	- 29
20	22,681	no adjustment	22,681	35,000	+12,319	+ 54
21	4,607 *	95	4,380	35,000	+30,620	+ 699
22	793 *	no adjustment	793	900	+ 107	+ 13
23	11,300	110	12,430	12,500	+ 70	+ 1
24	6,988	105	7,340	10,100	+ 2,760	+ 38
27	8,700	145	12,620	12,500	- 120	- 1
41	8,703	no adjustment	8,703	13,500	+ 4,797	+ 55
45	14,063	90	12,657	13,000	+ 343	+ 3
46	18,659	95	17,730	14,600	- 3,130	- 18
47	5,755	130	7,480	7,000	- 480	- 6
55	87,825	no adjustment	87,825	101,200	+13,375	+ 15
61	4,777	no adjustment	4,777	6,500	+ 1,723	+ 36
Totals	216,790		221,355	303,550	+82,195	

* Apparent 'after' value revised as shown in Table 5

TABLE 3

COMPARISON OF SALE PRICE AND 'AFTER' VALUE OF PARCELS
INVOLVED IN INTERSTATE PROJECTS

Case Study No.	Analysis of Part Sold	'Before' Value $	Amount of Settlement $	Apparent 'After' Value $	Sale Price $	Difference $	Difference %
3	0.5 acre lot	1,000	none	1,000	21,000	+20,000	+2000
15	landlocked 49 acres	16,704	14,616	2,088	17,500	+15,412	+ 738
25	total residual	9,825	1,091	8,734	7,500	- 1,234	- 14
26	total residual	8,000	800	7,200	4,433	- 2,767	- 38
28	total residual	10,546	10,221	325	1,500	+ 1,175	+ 362
29	0.27 acre	620	557	63	200	+ 137	+ 217
31	landlocked 0.87 acre	435	157	278	200	- 78	- 28
32	total residual	11,281	6,578	4,703	4,200	- 503	- 11
33	landlocked 19.6 acres	7,350	3,074	4,276	1,960	- 2,316	- 54
34	total residual	3,793	2,742	1,051	1,200	+ 149	+ 142
35	2.5 acres @ interchange	225	none	225	2,700	+ 2,475	+1100
36	40.25 acres	4,025	none	4,025	3,500	- 525	- 13
37	landlocked 8 acres	2,920	2,630	290	1,600	+ 1,310	+ 452
38	total residual	35,075	22,122	12,953	24,300	+11,347	+ 88
39	total residual	82,100	13,112	68,988	50,575	-18,413	- 27
40	severed 3.5 acres	3,665	2,370	1,295	1,400	+ 105	+ 8
42	total residual	10,500	8,335	2,165	1,600	- 565	- 26
43	0.1 acre	390	none	390	615	+ 225	+ 58
	Subtotals	208,454	88,405	120,049	145,983	+25,934	

TABLE 3 (continued)

Case Study No.	Analysis of Part Sold	'Before' Value $	Amount of Settlement $	Apparent 'After' Value $	Sale Price $	Difference $	Difference %
	Subtotals	208,454	88,405	120,049	145,983	+25,934	
48	total residual	96,000	9,500	86,500	87,000	+ 500	+ 6
49	total residual	21,605	14,233	7,372	5,500	- 1,872	- 253
50	landlocked 35.6 acres	8,900	7,560	1,340	1,600	+ 260	+ 19
51	13 acres	3,250	none	3,250	5,850	+ 2,600	+ 80
53	total residual	4,290	4,220	70	100	+ 30	+ 43
54	total residual	14,400	13,873	527	1,200	+ 673	+ 128
56	6 acres	12,000	406	11,594	9,000	- 2,594	- 22
57	0.5 acre	4,740	1,125	3,615	1,000	- 2,615	- 72
58	total residual	9,100	2,205	6,895	7,500	+ 605	+ 9
59	total residual	2,277	528	1,749	2,500	+ 751	+ 43
60	total residual	9,530	5,239	4,291	5,500	+ 1,209	+ 415
62	total residual	14,330	8,089	6,241	11,000	+ 4,759	+ 76
		410,616	155,283	255,233	283,733	+28,500	

TABLE 4

COMPARISON OF SALE PRICE AND ADJUSTED 'AFTER' VALUE
OF PARCELS INVOLVED IN INTERSTATE PROJECTS

Case Study No.	Apparent 'After' Value $	Adjustment to Date of Sale %	Adjusted 'After' Value $	Sale Price $	Difference $	Difference %
3	1,000	none	1,000	21,000	+20,000	+2,000
15	2,088	110	2,297	17,500	+15,203	+ 662
25	8,734	none	8,734	7,500	- 1,234	- 14
26	5,200 *	none	5,200	4,433	- 767	- 15
28	325	105	340	1,500	+ 1,160	+ 341
29	63	none	63	200	+ 137	+ 217
31	1,583 *	none	1,583	200	- 1,383	- 87
32	4,703	none	4,703	4,200	- 503	- 11
33	1,826 *	80	1,460	1,960	+ 500	+ 34
34	1,051	none	1,051	1,200	+ 149	+ 14
35	225	none	225	2,700	+ 2,475	+1,100
36	4,025	none	4,025	3,500	- 525	- 13
37	290	85	246	1,600	+ 1,354	+ 550
38	12,953	85	11,010	24,300	+13,290	+ 121
39	68,988	85	58,639	50,575	- 8,064	- 14
40	1,295	70	906	1,400	+ 494	+ 55
42	2,163	none	2,163	1,600	- 563	- 26
43	390	none	390	615	+ 225	+ 58
Subtotals	116,542		104,035	145,983	+41,948	

TABLE 4 (continued)

Case Study No.	Apparent 'After' Value $	Adjustment to Date of Sale %	Adjusted 'After' Value $	Sale Price $	Difference $	Difference %
Subtotals	116,542		104,035	145,983	+41,948	
48	86,500	none	86,500	87,000	+ 500	+ 0.6
49	7,372	none	7,372	5,500	- 1,872	- 25
50	1,340	none	1,340	1,600	+ 260	+ 19
51	3,250	none	3,250	5,850	+ 2,600	+ 80
53	70	none	70	100	+ 30	+ 43
54	527	none	527	1,200	+ 673	+128
56	11,594	none	11,594	9,000	- 2,594	- 22
57	3,615	none	3,615	1,000	- 2,615	- 73
58	6,895	none	6,895	7,500	+ 605	+ 9
59	1,749	none	1,749	2,500	+ 751	+ 43
60	4,291	none	4,291	5,500	+ 1,209	+ 28
62	6,241	none	6,241	11,000	+ 4,759	+ 76
Total	249,986		237,479	283,733	+46,254	

* Apparent 'after' value revised as shown in Table 5

TABLE 5

APPARENT 'AFTER' VALUES BASED ON REVISED 'BEFORE' VALUES
REQUIRED FOR FIVE CASE STUDIES

Case Study No.	Revised 'Before' Value $	Amount of Settlement $	Apparent 'After' Value $	Sale Price $	Difference $
21	5,000	393	4,607	35,000	+30,393
22	16,790	15,997	793	900	+ 107
26	6,000	800	5,200	4,433	- 767
31	1,740	157	1,583	200	- 1,383
33	4,900	3,074	1,826	1,960	+ 134
Totals	34,430		14,009		+28,848

Totals for the above parcels from data in Tables 1 and 3.

$34,751	$14,330	+28,156

In order to facilitate a visual comparison, the totals for 'before' value, 'after' value, and sale price are given in Table 6. These data show that for the residuals resulting from a taking for a primary or secondary highway, the total of the sale prices exceeded the total of the 'before' values. Yet the total of all settlements (see Table 1) amounted to $77,128, or about 25 percent, of the total of the 'before' values.

These figures do not, however, make allowance for any changes in real estate values that occurred between the time of the appraisal and the date of sale. The adjustment of the individual 'after' values, when necessary, to constant dollars as of the date of sale, hopefully eliminated such dollar differences. The adjusted totals also reflect the reappraisal of the 'before' values for case studies 21 and 22. Hence, the comparison of the values in the adjusted column of Table 6 is perhaps more meaningful.

This comparison shows, for the 16 parcels resulting in a case study on primary and secondary routes, that the total sale price exceeded the total 'after' value by $82,000, or about 35 percent. It is interesting to note that $61,600 of this excess was accounted for by three residuals (case studies 17, 20, and 21). All of these residuals are situated at choice intersections on limited access highways having fenced rights-of-way.

As a matter of interest, the 'before' values were also adjusted in those instances where there was a change in local land values. The total of these adjusted 'before' values (Table 6) presumably represents the approximate total price for which the entire properties would have sold if the various highway improvements had not been made. It will be noted that the total of the sale prices is still slightly in excess of this adjusted total "before" value for the residuals on primary and secondary routes.

TABLE 6

SUMMARY OF TOTAL 'BEFORE' VALUES AND TOTAL SALE PRICES - ROUNDED TO NEAREST $500

Total	Unadjusted	Adjusted
Primary and Secondary Routes:		
'Before' Value	$292,000	$302,000
Sale Price	$303,500	$303,500
Apparent 'After' Value	$214,000	$221,500
Excess	+$89,500	+$82,000
Interstate Routes:		
'Before' Value	$410,500	$389,600
Sale Price	$283,500	$283,500
Apparent 'After' Value	$255,000	$237,500
Excess	+$ 28,500	+$ 46,000

The number of cases in which the sale price of a remainder exceeded, was equal to, or was less than the 'after' value adjusted to the date of sale, is shown in Table 7 and 8. These frequency data show for primary and secondary routes that half (eight) of the residuals sold for an amount which was in excess of the 'after' value while only two residuals sold for an amount which was less.

The comparison of the totals for the interstate projects (Table 6) shows that the total of the sale prices was considerably below the total of the 'before' values and was more in line with the apparent 'after' value. On the whole, however, the total sale price still exceeded the adjusted 'after' value by $46,000, or 20 percent.

Three residuals (case studies 3, 15, and 38) each sold for a price that was considerably in excess of the 'after' value. They do not, however,

TABLE 7

SUMMARY OF DIFFERENCES BETWEEN ADJUSTED 'AFTER' VALUE AND SALE PRICE

Sale Price, $, Greater Than 'After' Value	Sale Price, $, (1) Equal to 'After' Value		Sale Price, $, Less Than 'After' Value
	Primary and Secondary Projects		
+ 1,894	+ 710	- 120	- 1,400
+ 18,607	+ 107	- 480	- 3,130
+ 12,319	+ 70		
+ 30,620	+ 343		
+ 2,760			
+ 4,797			
+ 13,375			
+ 1,723	+ 1,230	- 600	
+ 86,095	+ 630		- 4,530
	Interstate Projects		
+ 20,000	+ 137	- 767	- 1,234
+ 15,203	+ 500	- 503	- 1,383
+ 1,160	+ 149	- 525	- 8,064
+ 2,475	+ 494	- 563	- 1,872
+ 1,354	+ 225		- 2,594
+ 13,290	+ 500		- 2,615
+ 2,600	+ 260		
+ 1,209	+ 30		
+ 4,759	+ 673		
	+ 605		
	+ 751		
	+4,324	-2358	
+ 62,041	+ 1,966		-17,762

(1) if the difference was less than $1,000 and 5 percent of the sale price the 'after' value and sale price were declared to be equal.

TABLE 8

FREQUENCY WITH WHICH SALE PRICE EXCEEDED, EQUALED, OR WAS LESS THAN THE APPARENT 'AFTER' VALUE (1)

	Sale Price Greater Than 'After' Value	Sale Price Equal to 'After' Value	Sale Price Less Than 'After' Value
Primary and Secondary			
Adjusted 'After' Value	8	6	2
Interstate			
Adjusted 'After' Value	9	15	6
Primary, Secondary, and Interstate			
Adjusted 'After' Value	17	21	8

(1) if the difference was less than $1,000 and 5 percent of the sale price the 'after' value and sale price were declared to be equal.

appear to have anything in common. The portion of the residual sold in case study number 3 is located adjacent to an interchange and sold for a service station site. In number 15, the part sold was a landlocked tract for which substantial damages had been paid but which sold for slightly in excess of the appraised 'before' value. The residual in number 38 was a farm which was separated into two tracts; the unimproved tract sold to an adjacent farmer and the tract on which the improvements were located sold as a rural residence to an individual employed in town.

The fact that the collection of residuals for both the primary and secondary projects and the interstate projects sold for a total price that

was considerably in excess of their total 'after' value indicates that there were enhancements to some residuals and/or suggests that damages were overpaid in some instances. This conclusion is apparent despite the fact that the probable upwards bias in the total of the 'before' values resulted in a minimization of any excess. The percentage of cases in which the sale price significantly exceeded the 'apparent' after value was 50 percent (8 of 16) on primary and secondary routes and 30 percent (9 of 30) on interstate routes. Much smaller percentages of the case studies (20 percent for primary and secondary routes and ten percent for interstate projects) however, had sale prices which exceeded 'after' values by over $10,000.

Although the sale price exceeded the 'after' value for a sizeable number of the case studies, there were some residuals which sold for less than their apparent 'after' value (Tables 7 and 8). These included 15 percent (2 of 16) of the case studies from primary and secondary projects and 20 percent (6 of 30) from the interstate. Only one case study, however, had an 'after' value of more than four thousand dollars greater than the sale price, and it was less than $10,000. These percentages may be indicative of all residuals; if so, there is a sizeable number of instances over the entire state in which the amount realized by the property owner (the amount of the settlement plus the sale price of the remainder) is less than the 'before' value of his property.

The general upwards trend in real estate prices over the entire state in recent years would lead one to expect that the total of the adjusted 'before' values would exceed the total of the 'before' values as of their dates of appraisal. A similar result would of course be expected with

respect to the apparent 'after' values. The data shown in Table 6 for the primary and secondary routes reflect these expected results. The interstate data do not, however. The reason for this, in all probability, is that the interstate projects that were completed or under contract by the end of 1961 were largely in the rural areas, with only a few on the urban fringe areas. The rural influence on the adjusted values was predominant because of the fact that in nearly all cases, where there was a sizeable time interval between acquisition and sale of the residual, the remainder was located in a rural area. The control data indicated that, in most cases, the value of this type of property in the pertinent areas decreased in the time periods of interest. Hence, there were more negative than positive adjustments, and therefore a smaller adjusted than unadjusted total.

The data prepared by the Economic Research Service of the United States Department of Agriculture and reported periodically in the publication entitled "Farm Real Estate Market Developments" substantiates the results given by the control data. It shows an increase in the per acre value of Indiana farm land up until late 1959. From early 1960 to late 1961 these data indicate a lesser per acre value.

Comparison of Damages Paid and Sustained

A summary of the total damages paid and total damages sustained is shown in Table 9 for the primary and secondary routes and in Table 10 for the interstate projects. Damages paid are, of course, only a tabulation of the amounts indicated on the right-of-way buyer's status sheet, or in the appraisal upon which the settlement was based, as that part of the final settlement which was due to damages to the remainder.

TABLE 9

ANALYSIS OF DAMAGES TO THE PORTIONS OF REMAINDER PARCELS THAT HAVE BEEN SOLD - PRIMARY AND SECONDARY ROUTES

Case Study No.	Damages Paid			Sale Price as a Percent of		Damages Sustained (4)		Enhancements (4)	
	Due to (1)	Amount $	Percent of Remainder (2)	Apparent 'After' Value (3)	Remainder Value (2)	%	$	%	$
14		none		413	413		none	313	1,894
16	L	570	93	1875	123		none	23	140
17	R	1,008	6	214	201		none	101	17,599
19	P, F	1,600	33	71	54	46	3,000		
20	P, A	350	2	154	152		none	52	11,969
21	S, A	325	1 (5)	799	747		none	647	30,315
22	R	633	44 (5)	113	63	37	526		
23	R	3,135	22	100	79	21	3,375		
24	S	44	1	138	137		none	37	2,716
27	P	317	4	99	96	4	575		
41	P, F	5,889	40	155	92	8	1,172		
45	P	564	4	103	99	1	164		
46	P	806	4	82	79	21	3,987		
47	P, F, D	7,052	55	94	42	58	9,649		
55	D	3,412	4	115	111			11	9,963
61	R	189	4	136	131		none	31	1,534
Totals		25,894					22,448		76,130

Footnotes for Table 9

(1) L - landlocking; P - proximity; R - reduction in size;
S - shape; D - separation of property; F - cut or fill
U - loss of utility of improvements; A - restriction of access

(2) Remainder as used in this table is the 'before' value less that payment for the land and improvements taken; i.e. the amount paid for damages, if any, was not subtracted.

(3) 'Before' value less total amount paid for land and improvements plus damages to the remainder.

(4) The damages sustained or enhancements are the difference between the remainder value as defined in footnote 2 above and the sale price. In those instances where a change in the local real estate prices was measured, this remainder value was adjusted for this change.

(5) Figures shown are based on adjusted appraisal. As originally appraised -

case study #21: damages paid 4%
case study #22: damages paid 22%

TABLE 10

ANALYSIS OF DAMAGES TO PORTIONS OF REMAINDER PARCELS THAT HAVE BEEN SOLD - INTERSTATE PROJECTS

Case Study No.	Damages Paid			Sale Price as a Percent of		Damages Sustained (4)		Enhancements	
	Due to (1)	Amount $	Percent of Remainder (2)	Apparent 'After' Value (3)	Remainder Value (2)	%	$	%	$
3		none		2100	2100		none	2000	20,000
15	L	14,616	88	762	95	5	874		
25	S, F	500	5	85	81	19	1,734		
26	S	280	1 (5)	85	81	19	1,047		
28	D, S	6	2	440	431		none	331	1,152
29	R, D, S	557	90	317	32	68	420		
31	L	157	9 (5)	13	11	89	1,540		
32	D, P, F	3,718	44	89	50	50	4,221		
33	L	3,074	63 (5)	134	50	50	1,960		
34	R, P	1,575	60	114	46	54	1,426		
35		none		1200	1200		none	1100	2,475
36		none		87	87	13	525		
37	L	2,260	90	627	64	36	882		
38	D, R, P	9,281	42	221	129		none	29	5,411
39	S, D	6,692	9	86	79	21	13,753		
40	S, D	2,370	65	155	55	45	1,166		
42	F, U	1,500	41	74	44	56	2,065		
43		none		158	158		none	58	226
	Subtotals	46,586					31,613		29,264

TABLE 10 (continued)

Case Study No.	Damages Paid			Sale Price as a Percent of		Damages Sustained (4)		Enhancements	
	Due to (1)	Amount $	Percent of Remainder (2)	Apparent 'After' Value (3)	Remainder Value (2)	%	$	%	$
	Subtotals	46,586					31,613		29,264
48		none		101	101		none	1	500
49	P, R, F	3,425	32	75	51	49	5,297		
50	L	7,560	85	119	18	82	7,300		
51		none		180	180		none	80	2,600
53	R	400	85	143	21	79	370		
54	R	1,156	69	229	71	39	481		
56		none		78	78	22	2,594		
57	U	1,125	24	28	21	79	3,740		
58	F, P	1,925	22	109	85	15	1,320		
59		none		143	143		none	43	751
60	F, A	1,800	29	128	90	10	591		
62	P, F	7,156	53	176	82	18	2,397		
	Totals	71,133					55,703		33,115

Footnotes for Table 10

(1) L - landlocking; P - proximity; R - reduction in size;
S - shape; D - separation of property; F - cut or fill
U - loss of utility of improvements; A - restriction of access

(2) Remainder as used in this table is the 'before' value less that payment for the land and improvements taken; i.e. the amount paid for damages, if any, was not subtracted.

(3) 'Before' value less total amount paid for land and improvements plus damages to the remainder.

(4) The damages sustained on enhancements are the difference between the remainder value as defined in footnote 2 above and the sale price. In those instances where a change in the local real estate prices was measured, this remainder value was adjusted for this change.

(5) The figures indicated are based on the adjusted appraisal. As per original appraisal

Case Study	% Damages Paid
26	4
31	70
33	70

The damages sustained or the enhancements are the difference between the sale price and the remainder value. Remainder value, as used herein, was the 'before' value less the amount of the settlement paid for the land and improvements taken for right-of-way purposes (i.e. damages to the remainder were not subtracted from the 'before' value).

The data presented in Table 11 show that the total for damages paid on primary and secondary routes exceeded those sustained by about 15 percent. On first glance this would lead one to believe that a rather good job was being done with respect to the appraisal of damages. However, when the difference column is inspected, it becomes quite apparent, in fact, that there was a very serious problem.

If the difference between the damages paid and sustained was less than $300 or five percent of the sustained damages, the difference was declared to be not significant. Tables 12 and 13 show the frequency by which damages paid were significantly different or not significantly different. These tables are self-explanatory and will not be further discussed.

It will be observed that the total of overpaid damages (positive differences) (Table 11) is about 50 percent of the total damages sustained for the primary and secondary routes. There were three cases in which this difference exceeded $1000. All three of these parcels were located on limited access facilities having a fenced right-of-way; otherwise they do not appear to have anything in common. The discussion concerning these three remainders is included in a later section of this report dealing with particular types of damages.

The summation of the underpaid damages (negative differences) of Table 11 for primary and secondary routes totals nearly $7,700 or 35 percent of

TABLE 11

COMPARISON OF DAMAGES PAID AND SUSTAINED

Case Study	Damages Paid	Damages Sustained	Difference
Primary and Secondary Routes			
14	none	none*	--------
16	$ 570	none**	+$ 570
17	1,008	none*	+ 1,008
19	1,600	$ 3,000	- 1,400
20	350	none*	+ 350
21	325	none*	+ 325
22	633	526	+ 107
23	3,135	3,375	- 240
24	44	none*	+ 44
27	317	575	- 258
41	5,889	1,172	+ 4,717
45	564	164	+ 400
46	806	3,987	- 3,181
47	7,052	9,649	- 2,597
55	3,412	none*	+ 3,412
61	189	none*	+ 189
Totals	$25,894	$22,448	+$11,122 - 7,676
	Net Total for Primary and Secondary Routes		+$ 3,446
Interstate Routes			
3	none	none*	--------
15	$14,616	$ 874	+$13,742
25	500	1,734	- 1,234
26	280	1,047	- 767
28	6	none*	+ 6
29	557	420	+ 137
31	157	1,540	- 1,383
32	3,718	4,221	- 503

TABLE 11 (continued)

Case Study	Damages Paid	Damages Sustained	Difference
33	3,074	1,960	+ 1,114
34	1,575	1,426	+ 149
35	none	none*	--------
36	none	525	- 525
37	2,260	882	+ 1,378
38	9,281	none*	+ 9,281
39	6,692	13,753	- 7,061
40	2,370	1,166	+ 1,204
42	1,500	2,065	- 565
43	none	none**	--------
48	none	none*	--------
49	3,425	5,297	- 1,872
50	7,560	7,300	+ 260
51	none	none*	--------
53	400	370	+ 30
54	1,156	481	+ 675
56	none	2,594	- 2,594
57	1,125	3,740	- 2,615
58	1,925	1,320	+ 605
59	none	none*	--------
60	1,800	591	+ 1,209
62	7,156	2,397	+ 4,759
Totals	$71,133	$55,703	+$34,549
			- 19,119
		Net Total for Interstate Routes	+$15,430

* Residual was enhanced
** Residual was enhanced but the amount was less than $300

TABLE 12

SUMMARY OF FREQUENCY OF DAMAGES AND ENHANCEMENTS

Occurrence	Primary & Secondary		Interstate	
	No.	%	No.	%
a) Damages paid > damages sustained	1	6	9	30
b) Damages paid = damages sustained	5	31	4	13
c) Damages paid < damages sustained	3	19	8	26
d) Damages paid and enhancements sustained	6	38	2	7
e) No damages paid but damages sustained	0	0	2	7
f) No damages paid and enhancements sustained	1	6	5	17
g) No damages paid and no enhancements sustained	0	0	0	0
Total	16	100	30	100

Note: If the difference in the percent damages paid and sustained was less than five percent or $300, the damages paid were declared to be equal to those sustained.

TABLE 13

FREQUENCY BY WHICH DAMAGES PAID WERE GREATER THAN, EQUAL TO, OR LESS THAN DAMAGES SUSTAINED

Occurrence	Primary & Secondary		Interstate	
	No.	%	No.	%
Damages paid				
- exceeded damages sustained (1)	7	47	11	44
- equal to damages sustained (2)	5	33	4	16
- less than damages sustained (3)	3	20	10	40
Total	15	100	25	100
No damages paid or sustained (4)	1		5	
Total Case Studies	16		30	

(1) sum of frequency of occurrences a & d, in Table 12
(2) sum of frequency of occurrences b & g in Table 12
(3) sum of frequency of occurrences c & e in Table 12
(4) occurrances f in Table 12

the total of the damages sustained. Three of these were greater than $1000. However, as will be explained in the discussion of proximity damages, there is reason to believe that the largest of these (case study No. 46) is considerably more than the true amount of uncompensated damages.

The total overpayment of damages on interstate projects was $15,400 for the 30 case studies. This is nearly 30 percent of the actual damages sustained. Here again the primary problem is one of equitable treatment of the several property owners with respect to damages. The subtotal of the overpaid damages (positive differences) is about $34,500 which is over 60 percent of the sustained damages while the subtotal of underpaid damages (negative differences) is $19,100 or nearly 35 percent of the damages sustained.

The problem therefore is very definitely one of determining, as precisely as possible, the exact conditions under which remainder parcels are damaged and the magnitude of such damages. This is essential if each individual owner is to receive fair compensation. The data available from this study are obviously insufficient to accomplish this end. The data contained in Tables 14, 15, and 16 are an initial step towards this goal. The few case studies of this research, furthermore, indicate that it will probably be much simpler to classify and evaluate cases in which overpayments occur than where there are underpayments. This means that a considerable amount of additional research will probably be necessary before the problem of underpayment is solved.

At this point one further observation should be noted with respect to the damages paid and sustained. A comparison was made between the difference

in the totals of the damages paid and sustained (about $3,400, from Table 11) and the difference between the totals of the sale prices and the adjusted 'after' values ($82,000, from Table 6) for the primary and secondary roads. This comparison indicated that almost all of this latter difference was due to very substantial enhancements of a few remainders.

Similarly, a comparison was made for the interstate projects. The data in Table 11 show a net overpayment of $15,500. The difference in the total of the adjusted 'after' value and the total of the sale prices is $46,000. Thus, in the case of interstate routes, a sizeable portion (over 30 percent) of this latter difference was due to a net overpayment of damages.

Inasmuch as there were more case studies on interstate routes than on primary and secondary projects, an illustrative look at these differences on a per residual or per unit of study basis follows:

primary and secondary:

$$\frac{\text{difference in totals of sale price and 'after' value}}{\text{number of case studies}} = \frac{+\$82,000}{16} = +\$5,125$$

$$\frac{\text{portion due to net overpayment of damages}}{\text{number of case studies}} = \frac{+\$3,400}{16} = +\$212$$

$$\frac{\text{portion due to enhancements}}{\text{number of case studies}} = \frac{\$82,000 - \$3,400}{16} = +\$4,913$$

interstate:

$$\frac{\text{difference in totals of sale price and 'after' value}}{\text{number of case studies}} = \frac{+\$46,000}{30} = +\$1,533$$

$$\frac{\text{portion due to overpayment of damages}}{\text{number of case studies}} = \frac{+\$15,400}{30} = +\$513$$

$$\frac{\text{portion due to enhancements}}{\text{number of case studies}} = \frac{\$46,000 - \$15,400}{30} = +\$1,020$$

The reader must not attempt to apply these figures in the appraisal process. They are utilized herein only as a technique to reduce the data to a common denominator in order to show for the sample of this study the relative unimportance of the overpayment of damages with respect to enhancements on primary and secondary routes and its very noticeable importance on interstate routes.

The portion of the difference between the sale price and the apparent 'after' value was only about four percent ($212 out of $5125), on a unit basis, for primary and secondary routes. In the case of interstate routes it was a very sizeable 28 percent ($513 out of $1533). This indicates that, on the average, nearly all the excess of sale price over 'after' value for a residual resulting from a right-of-way taking for a primary or secondary highway was due to enhancement of the residual. In the case of residuals resulting from an interstate taking, a significant portion of this excess was from an overpayment of damages. On the other hand, it was noted earlier that the problem of the underpayment of damages was more serious on interstate projects.

It is to be expected that the effect of enhancements will become more important as additional interstate mileage is opened in the urban and urban fringe areas. The data obtained in this study suggests the desirability of making a future analysis on the basis of urban primary and secondary, urban interstate, rural primary and secondary, and rural interstate.

As previously mentioned, it would be desirable to determine the conditions under which over and underpayments of damages consistantly occur. Although the number of case studies is considerably less than the number necessary for a detailed analysis, the damages due to landlocking and separation, reduction in size, and proximity were studied in an attempt to determine if any indications might be drawn. In order to aid in this analysis, the damages paid and sustained by each residual against which a single type of damage was assessed were tabulated. Those residuals against which a certain type of damage as well as other damages were assessed were also listed.

Because of the very limited number of cases, the distinction between primary and secondary and interstate was not maintained in this analysis when there was no reason to believe that the damages should differ. Such is the situation in the case of separated and landlocked tracts.

Table 14 summarizes the damages paid for landlocking or separation of residuals and the damages or enhancements sustained. It will be observed that the damages paid for landlocking were over two times the dollar value of the damages actually sustained by these residuals. In fact, two of these residuals sold for amounts that were slightly in excess of, but not significantly greater than, the appraised "before" value.

Only one of the six landlocked residuals (case study 31) sustained damages in excess of the damages paid. In this case, the dollar difference was primarily due a poor appraisal of the 'before' value. The original appraisal estimated the landlocking damages to be 70 percent. If the revised "before" value would have been the basis of the settlement and this assessment of damages used, the following would have resulted:

revised "before" value	$1740
sale price	200
damages sustained	$1540 or 89%
damages that would have been paid	1230 or 70%
difference that would have been observed	$ 310

This difference of $310 is possibly significant but is relatively minor as compared the figure indicated in Table 14. This is important to note because in this instance the discrepancy between damages paid and sustained resulted primarily from an original 'before' valuation of the property that appears to be excessively low in comparison to similar property located nearby rather than from a considerable error in estimating the percent damages.

The remaining landlocked residuals were farm land and, with one exception, sustained damages of 50 percent or less. Indeed, two tracts sustained no damages although high percentages were paid. In one of these two cases, the dollar amount paid was quite large. The high percentage of damages sustained by the other exception (case study number 50) is quite likely, in part, due to an inflated "before" value. Damages of about 65 percent are probably more in line.

In the case of separated, but not landlocked residuals, the damages paid were over 3 1/2 times those sustained. In only one of five cases did the amount of damages sustained equal or exceed those paid. In fact, substantial damages were paid in two cases where damages were non-existent.

Table 15 summarizes the damages paid and sustained for those residuals where damages were assessed due to a reduction in size. These figures show

TABLE 14

ANALYSIS OF DAMAGES - LANDLOCKED AND SEPARATED TRACTS

Case Study	Damages Paid $	Damages Paid % of 'Before' value	Damages Sustained $	Damages Sustained % of 'Before' value	Enhancements $	Enhancements % of 'Before' value
landlocked tracts						
15	14,616	87	874	5		
16	570	93		none	140	23
31	157	9	1,540	89		
33	3,074	63	1,960	50		
37	2,260	90	882	36		
50	7,560	85	7,300	82		
subtotals	28,237		12,556		140	
separated, but not landlocked, tracts						
28 (1)	6	3		none	1,152	331
35 (2)	380	90	422	100		
38 (3)	3,529	31	2,170	19		
39 (4)	2,118	90		none		none
55 (5)	3,362	25		none		none
subtotals	9,395		2,592		1,152	
Totals	37,632		14,274		2,088	

(1) appraised damages also considered shape
(2) tract II only
(3) tract I only
(4) tract III only
(5) tract II only

TABLE 15

ANALYSIS OF DAMAGES - REDUCTION IN SIZE

Case Study	Damages Paid $	Damages Paid % of Remainder Value	Damages Sustained $	Damages Sustained % of Remainder Value	Enhancements $	Enhancements % of Remainder Value
Primary and Secondary Projects						
17	1,008	6			17,599	101
22	633	23	526	19		
23	3,135	22	3,375	24		
61	189	4			1,534	31
Subtotal	4,965		3,901		19,133	
Interstate Projects						
53	400	85	370	79		
54	1,156	69	481	29		
Subtotal	1,556		851			
Total	7,521		4,752		19,133	
Case studies in which damages due to a reduction in size as well as other damages were paid.						
29	557	90	420	68		
34	1,575	60	1,418	54		
38	9,281	42			5,411	29
49	3,425	32	5,297	49		

that in three of the six cases (22, 23, and 53), the damages sustained were, for all practical purposes, the same as those paid. In the one case where substantial damages were paid but sizeable enhancements were sustained, the difference is probably explained by the grantee being able to acquire an adjacent tract (see case study no. 17).

In addition to the six cases where damages due to reduction in size only were paid, one remainder (case study no. 38) was enhanced rather than damaged although damages were paid for a reduction in size as well as for other damages.

The summary of damages paid and sustained for the remainders where proximity damages only were paid, Table 16, shows that in two of the three cases, the payment agrees rather well with the damages sustained. In case number 46, there is a wide discrepancy between the damages paid and sustained. A portion of this difference might be due to the residence on the subject property being more expensive than the adjacent improvements. It is well known that such properties command a price that is somewhat lower than they would be if the adjacent improvements were of an equal quality. This conclusion is supported by the fact that the subject property of case study number 45 is an adjacent property and apparently suffered only slightly.

The number of observations obviously prevents any firm conclusions as to proximity damages. They do, however, suggest that such damages are relatively minor. This is reinforced by case study number 38 in which case a sizeable portion, approximately 30 percent, of the total damages paid was for proximity; although other sources of possible damages were also present, there were no damages sustained by the residual. The house, against which

TABLE 16

ANALYSIS OF DAMAGES - PROXIMITY

Case Study	Damages Paid $	Damages Paid % of Remainder Value	Damages Sustained $	Damages Sustained % of Remainder Value	Enhancements $	Enhancements % of Remainder Value
27	317	4	574	4		
45	564	4	164	1		
46	806	4	3,892	21		
Total	1,687		4,530			
Case studies in which proximity damages as well as damages due to other sources were paid.						
19	1,600	33	3,000	46		
20	350	2	none		11,969	52
41	5,889	40	1,172	8		
47	7,025	55	9,649	58		
32	3,718	44	4,221	50		
34	1,575	60	1,426	54		
38	9,281	42	none		5,411	29
49	3,425	32	5,297	49		
58	1,925	22	1,320	15		
62	7,156	53	2,397	18		

the proximity damages were paid, sold as a rural residence at a price in excess of its "before" value as a farm improvement.

Land Use Changes

Tables 17 and 18 summarize the land use histories of the several parcels as well as the grantee's stated anticipated use of the property after the date of sale. Tables 19, 20, and 21 further summarize the data as to whether the anticipated land use was different from that immediately after the right-of-way taking and as to whether a significant change in value occurred.

It is interesting to note that a significant enhancement was not measured unless a change in land use was anticipated by the grantee (buyer).

Of the 46 residuals or parts thereof included in this analysis, 19 were left vacant following the acquisition of the right-of-way. Four of these tracts sustained a significant enhancement in value. The grantees of three of these four tracts anticipated using them for commercial purposes (see Table 19); the grantee of the fourth purchased the residual as an investment.

Nine residuals were used for agricultural purposes following the taking; five of these experienced an enhancement. The anticipated use of these tracts after the date of sale were: commercial - two; road side services - one; commercial and residential combined - one; and agricultural and residential - one. In this last instance, a detailed study of the appraisals of the property and the sale prices indicates that the enhancement was primarily due to the portion of the residual that changed to a rural residential land use.

The land use of fourteen remainder parcels following the right-of-way acquisition was residential; three of these experienced an enhancement in

TABLE 17

LAND USE STATUS - PRIMARY AND SECONDARY PROJECTS

Case Study No.	Land Use (1) 'Before' Acquisition	'After' Acquisition	At Time of Study	Grantee's Anticipated Use At Purchase	Enhanced or Damages (2)
14	R, A	V	V	C	+
16	A	V	A	R	NS
17	R, C	R	S	S	+
19	R, V	R, V	R	R	-
20	R	R	V	S	+
21	A	A	V	S	+
22	R	V	V	R	NS
23	V	V	R	R	-
24	R, V	R, V	R	R	+
27	R	R	R	R	NS
41	R	R	R	R	-
45	R	R	R	R	NS
46	R	R	R	R	-
47	R, A	R	R	R	-
55	A	A	A, R	R, C	+
61	V	V	V	V (investment)	+

(1) land use: A - agricultural, C - commercial, R - residential, S - road-side services, V - vacant

(2) enhancements or damages are based on the sale price and the value of the remainder before damages were assessed ('before' value less payment for land and improvements taken). Enhancements are indicated by + and damages by -, NS indicates that there were no significant enhancements or damages; i.e., the difference between the sale price and the 'before' value less the amount of the settlement was less than $1000 and 5 percent.

TABLE 18

LAND USE STATUS - INTERSTATE PROJECTS

Case Study No.	Land Use (1) 'Before' Acquisition	'After' Acquisition	At Time of Study	Grantee's Anticipated Use At Purchase	Enhancements or Damages
3	R	R	S	S	+
15	A	V	A	A	NS
25	R, A	R, A	R, A	R, A	-
26	A	A	A	A	-
28	R, A	V	Special	C	+
29	V	V	V	R	NS
31	R	V	V	V	-
32	R	R, V	R, V	R, V	-
33	A	V	A	A	-
34	R	R	R	R	-
35	A	A	V	S	+
36	A	A	R, A	R, A	NS
37	A	V	A	A	NS
38	A	A	R, A	R, A	+
39	A	A	A	A	-
40	R, A	V	R	R	-
42	R	V	R	Special	-
43	R	R	R	R	NS
48	A	A	A	A	NS
49	R	R	R	R	-
50	A	V	A	A	-
51	A	A	V	C	+
53	R	V	V	R	NS
54	R	V	R	R	NS
56	V	V	V	Special	-
57	R	V	R	R	-
58	R	R	R	R	-
59	V	V	Special	C	NS
60	R	R	R	R	NS
62	R	R	R	R	-

(1) land use: A - agricultural, C - commercial, R - residential, S - road-side services, V - vacant

TABLE 19

SUMMARY OF LAND USE CHANGES AND CHANGES IN VALUE

Land Use After R/W Acquisition	Anticipated Land Use After Sale	Number of Residuals		
		Enhanced	Damaged	No Change
agricultural	agricultural	0	2	1
	road-side services	2	0	0
	commercial	1	0	0
	residential and commercial	1	0	0
	residential and agricultural	1	0	1
	Subtotals	5	2	2
residential	residential	0	7	4
	road-side services	3	0	0
	Subtotals	3	7	4
vacant	agricultural	0	2	2
	commercial	3	0	1
	residential	0	3	5
	vacant	0	1	0
	special	0	2	0
	Subtotals	3	8	8
residential and agricultural	residential and agricultural	0	1	0
residential and vacant	residential	1	1	0
	residential and vacant	0	1	0
	Total Case Studies	12	20	14

TABLE 20

SUMMARY OF LAND USE CHANGES ACCORDING TO THE GRANTEE'S ANTICIPATED USE AT THE TIME OF SALE

Anticipated Land Use	Number of Residuals		
	Enhanced	Damages	No Change
agricultural	0	4	3
commercial	4	0	1
residential	0	10	9
vacant	0	1	0
road-side service	5	0	0
other	3	5	1
Totals	12	20	14

TABLE 21

CHANGE IN LAND USE COMPARED TO CHANGE IN VALUE

Change in Land Use Occurred or Anticipated	Frequency of Occurrence			
	Damaged	Enhanced	Not Significant	Total
Yes	6	12	9	27
No	14	0	5	19
Total	20	12	14	46

value. In all three instances, the anticipated land use at the date of sale was for road side services (motels, gas stations, etc.).

These case studies show that every residual, or portion thereof, which sold for an anticipated commercial or road side service land use reflected a significant enhancement in value. This is to be expected inasmuch as this represents an anticipated change to a higher land use.

The residuals that were residential after the taking and continued in this land use suffered damages as a group; four remainders reflected no significant change in value while six suffered significant damages.

Time Elapsed Between Acquisition and Sale of Residual

The number of months which elapsed between the date of the appraisal and the sale of the residual was determined for each residual. The date on which the property was originally appraised was utilized because: 1) some remainders sold immediately after this appraisal was made and before the final settlement was reached and other remainders were involved in lengthy condemnation proceedings which did not conclude in a settlement until after the residual had been sold; and 2) the date of appraisal appeared to be the most logical choice because it would be at that time that the original owner would have substantial knowledge concerning the extent and the nature of the right-of-way taking.

The number of months elapsed together with a notation as to whether the remainder was enhanced or damaged is given in Table 22 for primary and secondary routes and in Table 24 for interstate routes. As was stated in a previous section of this report, a remainder was declared to have been enhanced if the sale price exceeded the remainder value by $300 or five

TABLE 22

TIME ELAPSED BETWEEN ACQUISITION AND SALE OF RESIDUAL PRIMARY AND SECONDARY PROJECTS

Case Study	Months Elapsed	Enhanced or Damaged
14	9	+
16	8	NS
17	8	+
19	1	-
20	2	+
21	11, 20	+
22	4	NS
23	6, 10, 23	-
24	5	+
27	66	NS
41	6	-
45	34	NS
46	46	-
47	37	-
55	2, 23	+
61	5	+

Time elapsed between date of appraisal and sale of residual or portion thereof:

Residual was	Average	Median
enhanced (+)	9	8
damaged (-)	18	10
not significantly changed (NS)	28	21
all tracts sold		8 1/2

TABLE 23

CONTINGENCY TABLE FOR TEST OF DIFFERENCE IN ELAPSED TIME - PRIMARY AND SECONDARY PROJECTS

	Number of Tracts Sold			
	Enhanced	Damaged	No Change	Total
Below Median	5	3	2	10
Above Median	4	4	2	10
Total	9	7	4	20
Theoretical frequency	4.5	3.5	2	

χ^2 calculated = 0.3

$\chi^2_{0.10,\ 2d.f.}$

The calculated value of Chi Squared is less than the tabled value. Therefore, there is no indication that the residuals sold that were enhanced, damaged, or unchanged come from different populations at the ten percent significance level. The small theoretical cell frequencies may seriously affect the power of the test (a conservative rule is to have a theoretical frequency of at least five for any one cell). However, it may be noted that in this instance a very large error in the tabled value of Chi Square can be accepted before the results of the test are subject to serious question. For additional information on the application of this technique when small cell frequencies are involved the reader is referred to the paper entitled "The χ^2-Correction for Continuity" by W. G. Cochran in the Iowa State College Journal of Science, Vol. XVI.

TABLE 24

TIME ELAPSED BETWEEN ACQUISITION AND SALE OF RESIDUAL - INTERSTATE PROJECTS

Case Study	Months Elapsed	Enhanced or Damaged
3	26	+
15	18	NS
25	13	-
26	9	-
28	18	+
29	24	NS
31	8	-
32	16	-
33	30	-
34	1	-
35	31	+
36	43	NS
37	10	NS
38	9, 10	+
39	6	-
40	31	-
42	4	-
43	7	NS
48	21	NS
49	5	-
50	14	-
51	36	+
53	32	NS
54	17	NS
56	23	-
57	2	-
58	21	-
59	19	NS
60	18	NS
62	5	-

TABLE 24 (continued)

Average time elapsed:

Residual was	Average	Median
enhanced (+)	21	22
damaged (-)	12	9
no significant change (NS)	21	18
all residual tracts sold		17

TABLE 25

CONTINGENCY TABLE FOR TEST OF DIFFERENCE IN ELAPSED TIME - INTERSTATE ROUTES

	Number of Tracts Sold			
	Enhanced	Damaged	No Change	Total
Below Median	2	10	3	15
Above Median	4	5	6	15
Total	6	15	9	30
Theoretical frequency	3	7.5	4.5	

χ^2 calculated = 3.3

χ^2 0.10, 2d.f.

The calculated value of Chi Squared is less than the tabled value; therefore the hypothesis that all observations come from populations having the same distribution is not rejected at the ten percent significance level. Thus, there is no statistically significant difference between the elapsed time between acquisition and sale for the enhanced or damaged residuals. However, as was pointed out on page 64, a theoretical frequency of less than five in any one cell may seriously affect the test statistic.

A change of one in high cell frequencies would result in a change of about ten percent in the calculated value of Chi Squared in this instance. Therefore, the reader is cautioned against accepting the test as being "certain" in this instance.

percent. It was declared to have been damaged if the sale price was less than the remainder value by $300 or five percent or greater. All other remainders were declared to have not been significantly affected (denoted by NS in Tables 22 and 24).

An analysis was performed in order to determine if there was a significant difference in the elapsed time for enhanced, damaged, and unaffected remainders. These analyses are summarized in Tables 23 and 25 for primary and secondary routes and interstate routes respectively. In both instances there was no significant difference (at the ten percent significance level) in the median time elapsed between the time of acquisition and the date of sale for enhanced, damaged, or unaffected remainders. Therefore, there was no reason found in this study to indicate that enhanced remainders sell any sooner (or later) than remainders that are damaged.

Comparison of Stated and Inferred Sale Prices

In the process of collecting data on the subject properties and the control parcels, it was of course necessary to obtain data relative to the sale price of these properties.

In those instances where the check for transfers of title was made using the general index of deeds, it was a simple matter to determine the amount of revenue stamps recorded on the deed inasmuch as the book and page number are indicated in the index. In many cases, the balance of the mortgage assumed was indicated in the deed; in other cases, a reference to the mortgage was made in the deed and the balance determined from the mortgage record and/or interview. The sum of the inferred value from the revenue stamps plus the amount of any mortgage is indicated in Table 26 for many properties for which data were obtained.

Another basis for inferring the sale price was available in some instances. Indiana law specifies that a 1 1/2 percent tax be paid on all gross income including the sale of real estate. After July 1, 1960, this 1 1/2 percent tax had to be paid at the time the deed was recorded; the amount of tax paid is recorded on the deed.

The stated sale prices shown in Table 26 were obtained through an interview with the grantee and/or grantor. This list does not, however, contain all the stated sale prices obtained -- it shows only those for which an inferred price, based on the amount of revenue stamps purchased plus the balance of any mortgage and/or the amount of gross income tax paid, was obtained. In about another 75 cases, sale price was obtained by interview but no inferred price was obtained.

The summations of the stated and inferred sale prices are shown below. The totals for each of the three comparisons, of course, include only those entries for which all the necessary data are given.

Totals of sale prices:

inferred from U. S. Revenue Stamps	$440,750	to	$478,800
stated			$478,200

Totals of sale prices:

inferred from Indiana Gross Income Tax	$145,075
stated	$145,375

Totals of sale prices:

inferred from U. S. Revenue Stamps	$108,500	to	$113,500
inferred from Indiana Gross Income Tax			$113,575
stated			$113,875

TABLE 26

COMPARISON OF INFERRED AND STATED SALE PRICES

Inferred Sale Price in Dollars		Stated Sale Price in Dollars
From U.S. Revenue Stamps	From Indiana Gross Income Tax	
1000 - 1500		1000
100 - 500		500
1500 - 2000		2000
500 - 1000		1000
500 - 1000		1000
500 - 1000		1000
100 - 500		400
500 - 1000		1000
500 - 1000		750
100 - 500		600
100 - 500		500
100 - 500		500
1000 - 1500		1300
100 - 500		300
500 - 1000		1000
500 - 1000		700
1000 - 1500		1200
1500 - 2000		2200
100 - 500		250
1000 - 1500		1400
100 - 500		200
100 - 500		200
1500 - 2000		1960
13000 - 13500		13500
1000 - 1500		1200
8500 - 9000		8900
6500 - 7000		7000
3000 - 3500		3500
1000 - 1500		1200
3500 - 4000		3950
1000 - 1500		1400
500 - 1000		1000
1000 - 1500	900	1200
14500 - 15000		15000
4500 - 5000		4700

TABLE 26 (continued)

Inferred Sale Price in Dollars		Stated Sale Price in Dollars
From U.S. Revenue Stamps	From Indiana Gross Income Tax	
500 - 1000		700
1500 - 2000	1600	1600
18500 - 19000	18675	18675
2000 - 2500	2400	2400
	13600	13600
	15900	15900
9000 - 9500	9300	9300
14500 - 15000	15000	15000
39500 - 40000		40000
4000 - 4500		4433
	2000	2000
1000 - 1500		1500
1000 - 1500		1000
1000 - 1500	1200	1200
1000 - 1500		1400
6000 - 6500		6500
7000 - 7500		7500
0 - 100		100
100 - 500		150
2500 - 3000		2000
3500 - 4000		4000
1500 - 2000		2000
9000 - 9500		9000
500 - 1000		1000
1500 - 2000		1800
11500 - 12000		11000
5000 - 5500		5500
34500 - 35000	35000	35000
34500 - 35000		35000
500 - 1000		900
7300 - 7800		7500
1500 - 2000		1650
1500 - 2000		1700
2500 - 9000		9100
17000 - 17500	17500	17500
33000 - 33500		32000

TABLE 26 (continued)

Inferred Sale Price in Dollars		Stated Sale Price in Dollars
From U.S. Revenue Stamps	From Indiana Gross Income Tax	
1000 - 1500		1200
9500 - 10000	10000	10000
2000 - 2500		2500
33250 - 33750		35000
500 - 1000		750
5000 - 5500		5850
1500 - 2000		1600
8200 - 8700		8700
11500 - 12000		12000
8500 - 9000		8100
9000 - 9500		10000

These totals indicate that the inferred sale prices are a good estimate of the total sale prices of a collection of properties. They further show that if revenue stamps are utilized to infer the sale prices, the upper limit should be used.

The obvious shortcoming of an inferred price based on the revenue stamps is the $500 range between the low and high possibilities of the estimate. This seriously restricts the value of this estimate when the sale price is small. The very good agreement between the individual sale prices inferred from the revenue stamps and the stated prices should also be noted.

A sale price inferred from the gross income tax paid is precise to a fraction of a dollar and is therefore superior to the revenue stamps in inferring the sale price. A visual comparison of the individual stated sale prices and those inferred from the gross income tax paid shows that there was only one case where this pair of figures did not agree. Although the number of comparisons was small, these data suggest that this inferred price is a reliable indication of the actual sale price both for an individual property and a collection of properties.

Even though it appears that a very reliable indication of sale price is available through the amount of gross income tax paid, it is still necessary to interview the grantee and/or grantor in order to obtain or verify other information, such as anticipated land use, changes in property, etc. Such an inferred sale price, however, might be utilized when this is the only information that cannot be determined. It might also be utilized in other land use-land value research, such as the general impact of a particular highway improvement. Sale price inferred from revenue stamps is also satisfactory for such a purpose.

SUMMARY OF FINDINGS

On Data Obtained

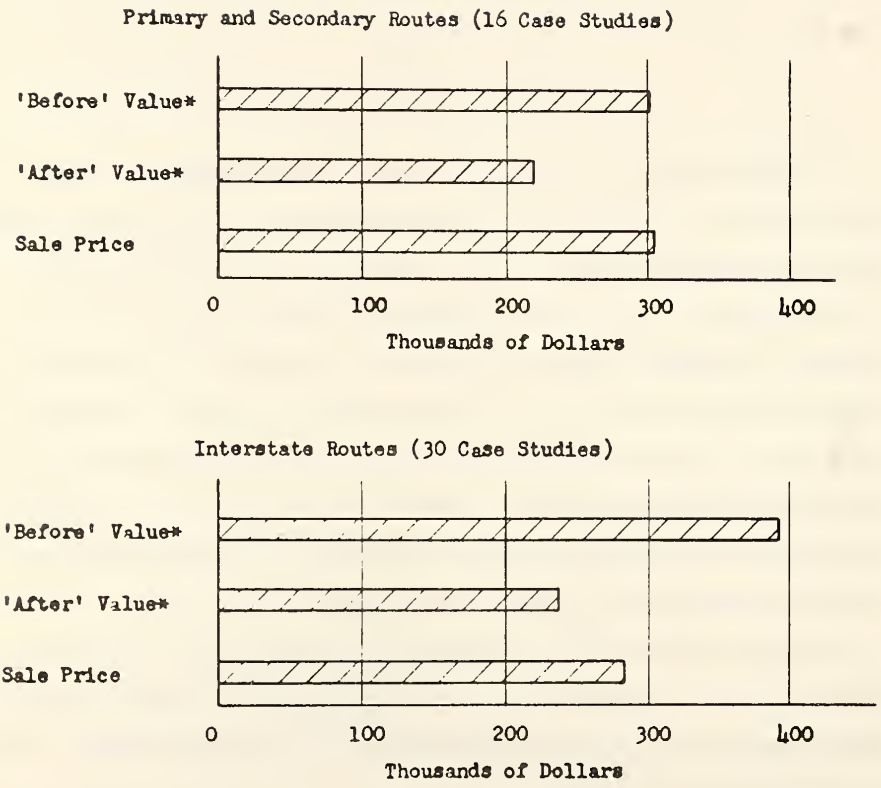
Random samples of 35 primary and secondary and 31 interstate right-of-way projects were drawn from all the primary-secondary and interstate right-of-way projects placed under contract during the years 1955 through 1961.

On the average, about four of each 100 residual parcels or portions thereof that resulted from a right-of-way acquisition in the primary-secondary sample were sold each year. Case studies developed for about ten percent of the residuals or portions thereof that were sold. Of the remainder parcels that resulted from an acquisition in the interstate sample, a title change was recorded for slightly over three percent per year. Case studies developed for about thirty percent of these sold remainders.

As of the end of 1962, this research had provided a total of 46 case studies of which 16 pertain to residuals resulting from a taking for a primary or secondary route and 30 which concern residuals resulting from interstate highway construction.

Summary of Sale Price Compared to 'After' Value

Figure 4 makes a comparison between the totals of the 'before' values and the apparent 'after' values ('before' value less the amount of the settlement) with the total of the sale prices. Where only a portion of the original parcel was sold, the analysis was based on the appraised value of the part sold and that portion of the settlement assignable to it.



* Individual values have been adjusted for any change in local real estate price level that occurred between the time of the appraisal and the date of sale.

COMPARISON OF TOTALS FOR 'BEFORE' VALUE, 'AFTER' VALUE, AND SALE PRICE IN CONSTANT DOLLARS

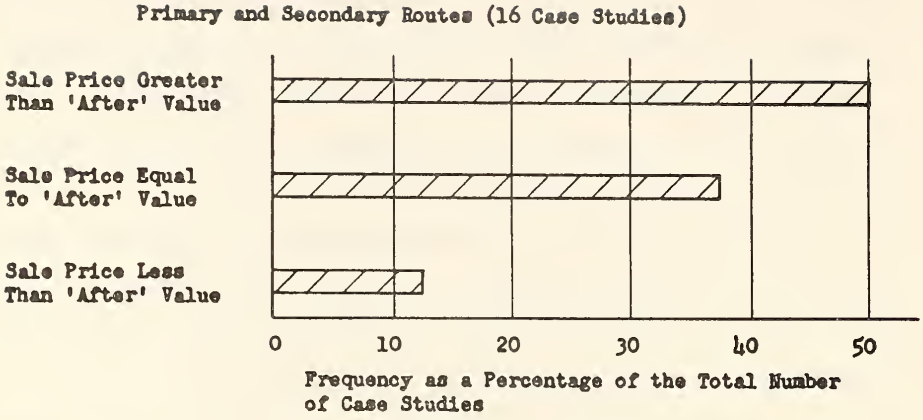
FIGURE 4

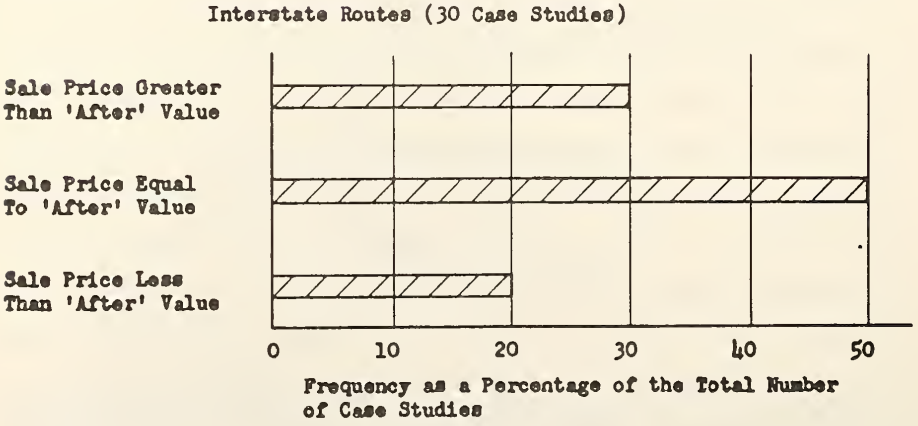
The totals represented are in constant dollars as of the date of sale of the remainder tracts. It will be observed that the total sale price was slightly in excess of the total 'before' value for the parcels involved in a primary or secondary road project. This was true even though the total amount of the settlements made with the property owners was equal to approximately 25 percent of the 'before' value.

For parcels involved in an interstate project, the settlements amounted to nearly 40 percent of the total 'before' value. Even though the total of the sale price exceeded the total of the 'after' values by a little over 15 percent, it was considerably less than the 'before' value.

These data indicate that there was, on the whole, a general overpayment for highway right-of-way in the state of Indiana in this period. The data for the primary and secondary routes especially reflects the occurrence of significant enhancements to some remainder tracts. Nevertheless, there was considerable difference between the individual residuals when each sale price was compared to its corresponding 'after' value. The relative frequencies by which the 'after' values and sale prices differed are shown in Figure 5. These data show that even though there was a general overpayment, there were some property owners who apparently suffered a significant financial loss as a result of the right-of-way acquisition. This problem was roughly twice as numerous in the case of interstate acquisitions as for primary or secondary projects. On the other hand, a higher percentage of the 'after' values were in accord with the subsequent sale price for interstate projects.

The data also show that a larger percentage of the primary and secondary remainders had a sale price significantly larger than the 'after' value.





FREQUENCY BY WHICH THE 'AFTER' VALUES DIFFERED SIGNIFICANTLY FROM THE SALE PRICES

FIGURE 5

This suggests that a higher percentage of the remainders on secondary-primary routes were enhanced (or received an overpayment for damages) than on interstate routes. The data in Table 27 reveal that three of the remainders on the primary and secondary routes accounted for over 70 percent of the total

TABLE 27

SUMMARY OF DOLLAR DIFFERENCES BETWEEN 'AFTER' VALUES AND SALE PRICES

	Sale Price Greater Than 'After' Value (+)	Sale Price Less Than 'After' Value (-)
Primary and Secondary (16 case studies)		
Total	$86,100	$ 4,500
Three Cases	61,500	
Interstate (30 case studies)		
Total	62,000	17,00
Three cases	48,500	

positive difference between the sale price and the 'after' value. A detailed study of these three cases revealed that they were all located at choice at-grade intersections near urban areas on limited access highways having a fenced right-of-way. In all three instances, the amount by which the sale price exceeded the 'after' value was primarily due to very substantial enhancements and not due to an overpayment of damages.

For the interstate routes, another three remainders accounted for over 75 percent of the total positive difference. In one case, the difference

was due to enhancements; in another, it was due exclusively to an overpayment of damages. In the third, a combination of enhancement and overpayment for damages was involved.

A comparison of the total positive differences between sale prices and 'after' values, together with the amount of the enhancements given in Table 28, shows that the 16 residuals on primary and secondary routes experienced considerably more enhancements than the 30 residuals on the interstate routes. This should not be interpreted to mean that there are more enhancements to residuals on all primary routes than on all interstate routes. One probable reason for this result in this study is that at the time this study was made the majority of existing interstate mileage was in rural areas rather than in the urban fringe where more substantial affects are to be expected.

Summary of Damages and Enhancements

The comparison of total damages paid and sustained (see Table 28) indicates that the damages paid exceeded those sustained by about 15 percent on primary and secondary routes and by nearly 30 percent on interstate routes. Thus, it must be concluded that there was a general overpayment of damages for the state as a whole. However, of equal or perhaps more importance is the question of the equitability of the treatment of the various property owners. Figure 6 portrays the percentage of times the damages paid and sustained were equal. In over 45 percent of the cases where damages were paid and/or sustained on primary or secondary routes, the damages paid were significantly greater than those sustained. In 20 percent of the cases, the damages paid were less than those apparently sustained.

TABLE 28

SUMMARY OF TOTAL DAMAGES PAID AND TOTAL DAMAGES OR ENHANCEMENTS SUSTAINED

	Primary and Secondary Routes	Interstate Routes
Damages Paid *	$25,900	$71,100
Damages Sustained*	22,400	55,700
Overpayment of Damages	$ 3,500	$15,400
Percent Overpayment	16%	28%
Enhancements Sustained*	$76,100	$33,100

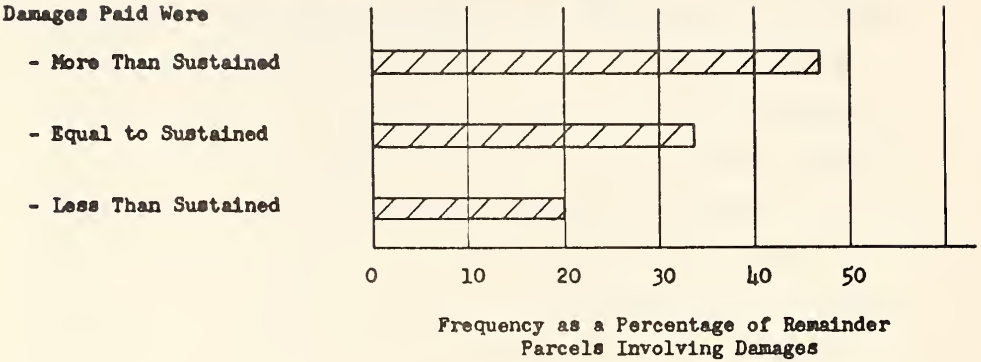
* Figures shown are rounded to the nearest $100.

The problem of underpayment of damages was more serious in the case of remainder tracts created by an interstate route - 40 percent of these sustained significantly more damages than were paid. Yet the total overpayment was found to be a substantial amount as well as a rather high percentage. Figure 6 also shows that the damages paid were equal to those sustained in only about 15 percent of the cases.

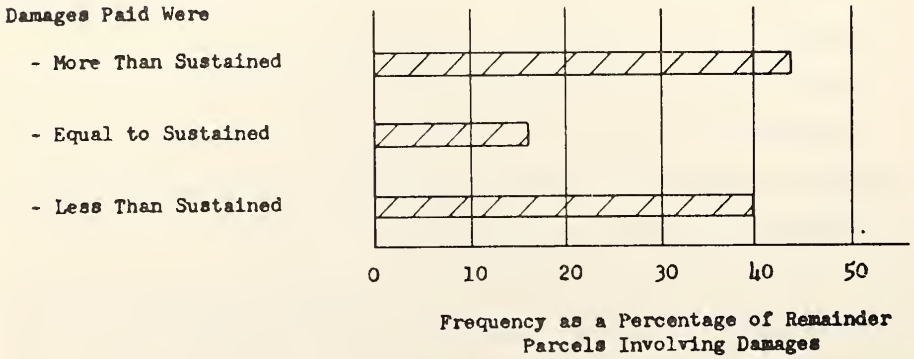
The fact that damages were overpaid in some instances and underpaid in others brings up a question as to their relative magnitudes. Table 29 summarizes the averages for those remainders (or portions thereof) where a significant overpayment or underpayment of damages occurred.

It is highly probable that the average amount found as an underpayment of damages is an inflated figure. This resulted from the normal tendency of appraisers to place a high estimated 'before' value on property, the value

Primary and Secondary Routes



Interstate Routes



FREQUENCY WITH WHICH THE DAMAGES PAID EQUALED THE DAMAGES SUSTAINED

FIGURE 6

TABLE 29

SUMMARY OF AVERAGE DAMAGES AND AVERAGE ENHANCEMENTS PER CASE STUDY

	Primary and Secondary Projects	Interstate Projects
Average For All Case Studies:		
Number of Case Studies	16	30
Average Amount by Which Sale Price Exceeded 'After' Value	$ 5,125	$ 1,535
Average Net Overpayment for Damages	$ 210	$ 515
Average Enhancements	$ 4,915	$ 1,020
Number of Case Studies Where Sale Price Equaled 'After' Value	5	15
Case Studies Where Damages Were Significantly Overpaid:		
Number of Case Studies	7	9
Average Overpayment for Damages	$ 1,540	$ 3,775
Case Studies Where Damages Were Significantly Underpaid:		
Number of Case Studies	3	10
Average Underpayment for Damages	$ 2,390	$ 1,910
Case Studies Where Significant Enhancements Were Observed:		
Number of Case Studies	7	7
Average Amount of Enhancements	$10,860	$ 4,700

from which the damages sustained were computed. This same fact probably resulted in the average overpayment of damages as shown in Table 29 being less than it actually was.

The table also shows the average enhancements which accrued to those remainders (or portions thereof) which were enhanced. It may be observed that the average enhancements for those parcels on primary and secondary projects were very substantial and were over twice the average for enhancements of interstate projects.

It may also be noted that the total of the number of case studies for which damages were overpaid and underpaid, plus those for which there were enhancements, plus those for which the sale price and 'after' value were not significantly different does not equal the total number of case studies. This is because many of the case studies in which an overpayment was observed were also enhanced.

The summary (Table 29) indicates that a major problem exists with respect to developing appraisal techniques useful for the evaluation of damages. It is hoped that this investigation will be only an initial phase in the process of bringing the total damages paid more "in line" with those sustained. Also, and perhaps more important, a more equitable treatment of the property owners should be attained - especially with respect to the elimination of uncompensated damages. It also indicates that the sizeable enhancements which occur to some properties as a result of highway construction should be considered in the right-of-way acquisition process.

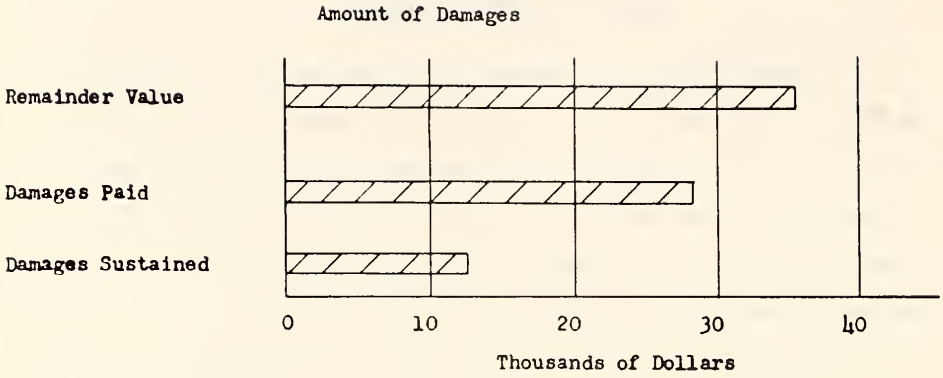
Summary of Types of Damages

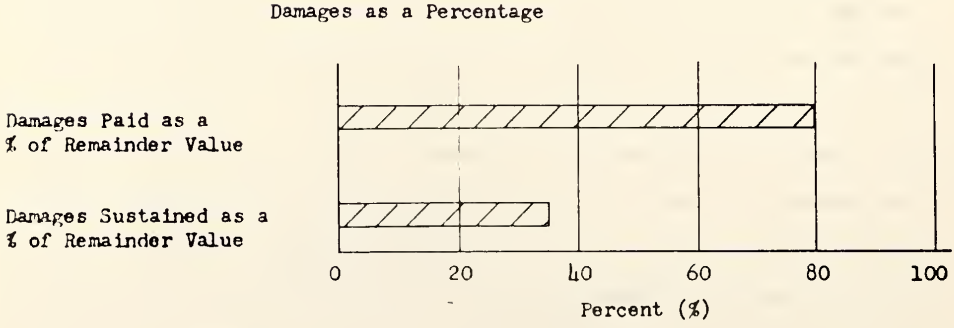
The determination of the extent to which certain types of damages affect the value of the residual is of paramount importance. A sufficient number of residual tracts against which only one type of damage was appraised were studied in the conduct of this research and permitted an initial analysis of the following types of damages: landlocking, separation of the property into two or more pieces, and a reduction in size.

A summary of the data for the landlocked tracts is presented in Figure 7. For the six landlocked tracts as a group, the average damages paid were equal to 80 percent of the total of the remainder values. Average damages sustained were only 35 percent. The damages paid were significantly greater than those sustained in four cases, were equal to those paid in one case, and less in another. However, the latter case was quite possibly the result of an inflated appraisal of the 'before' value.

Similar data are presented in Figure 8 for five tracts that were separated from the main body of the residual; these tracts were not, however, landlocked. For the collection of these cases, the damages paid amounted to 30 percent of the total of the remainder values while those sustained were less than 10 percent. There were three cases, in which no damages were sustained; one of these, for which only nominal damages were paid, experienced a significant enhancement. In one of the two instances where there were sustained damages, the damages paid were significantly larger than those sustained. In the other, the damages paid and sustained were not significantly different.

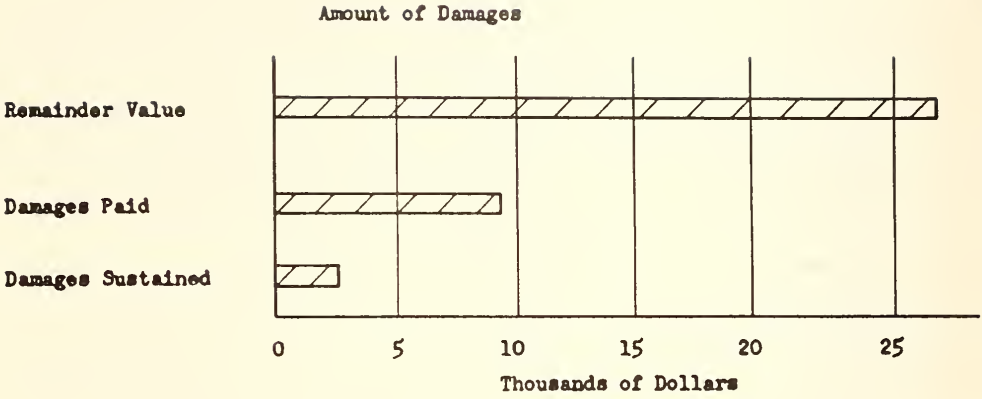
Damages due to reduction of size only were paid in five instances. A summary of these data are shown in Figure 9. For the group, the damages

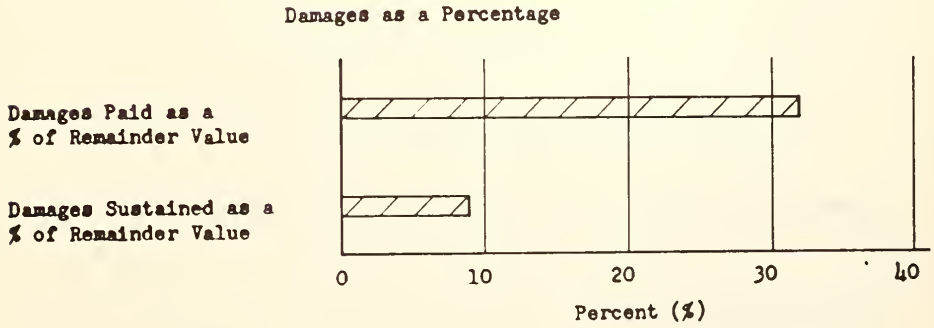




SUMMARY OF DAMAGES PAID AND SUSTAINED BY LANDLOCKED TRACTS

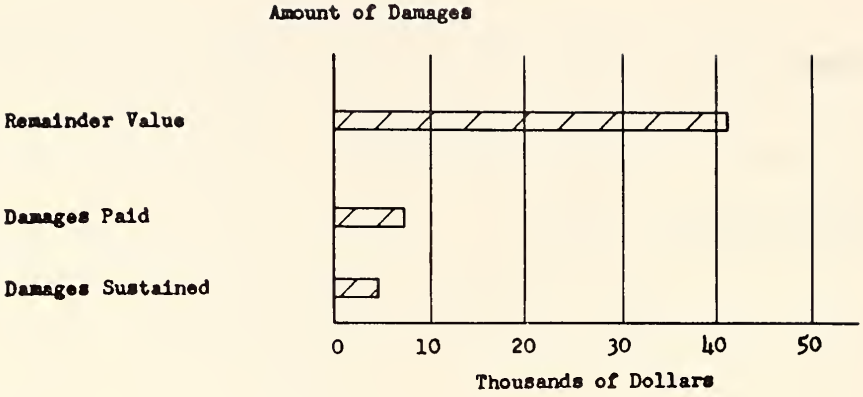
FIGURE 7

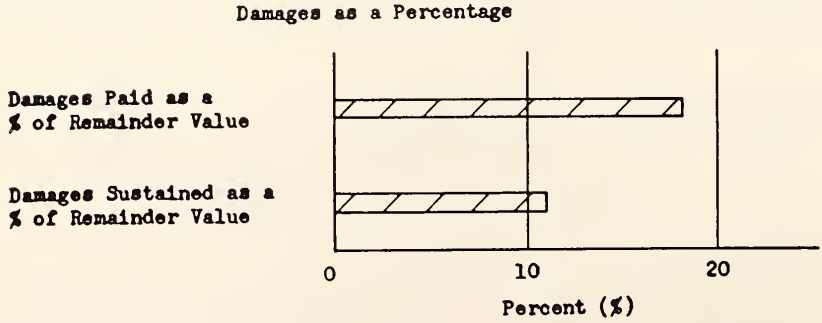




SUMMARY OF DAMAGES PAID AND SUSTAINED BY SEPARATED TRACTS

FIGURE 8





SUMMARY OF DAMAGES DUE TO A REDUCTION IN SIZE

FIGURE 9

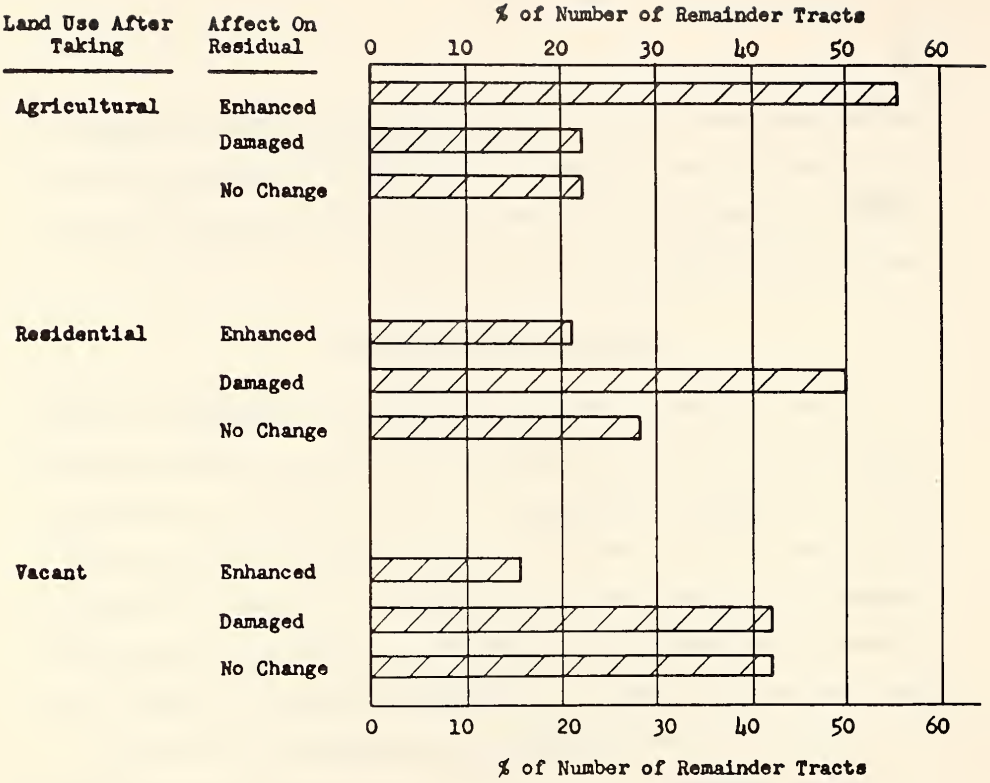
paid averaged over 15 percent of the remainder value while the damages sustained were just over 10 percent. In two cases, the damages paid were not significantly different from those sustained; they significantly exceeded the damages sustained in the other three cases.

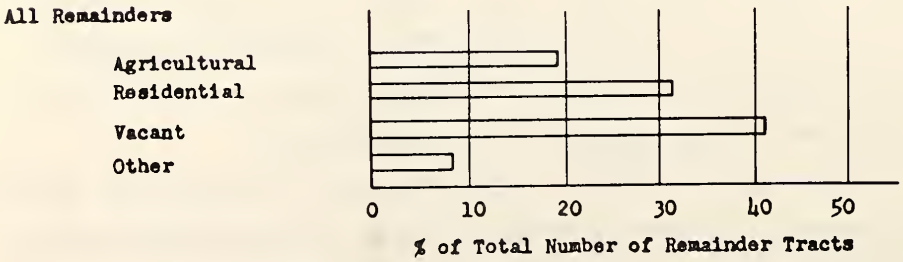
Summary of Land Use Changes

Figure 10 presents a summary of the damages or enhancements sustained on the basis of the land use immediately following the right-of-way acquisition. The bar-graph at the bottom of the figure indicates the percentage of the remainder tracts in each of the four land use classifications; no remainders were studied which were commercial or industrial. The upper portion shows the percentage of the residuals in each land use classification that were enhanced, damaged, or experienced no significant change in value.

It will be observed that about 55 percent of the tracts that were utilized for agricultural purposes just after the taking subsequently experienced an enhancement in value. This should not be interpreted to mean that a large acreage of agricultural land is enhanced. The majority of the agricultural tracts that resulted in a case study included herein were of very small acreage and were located near interchanges and/or were unique in that a subsequent land use change occurred or was anticipated.

It will also be noted that a high percentage of the tracts which continued in residential use after the taking were damaged and that relatively few were enhanced. The fact that there are considerable deterrents which keep properties in an established residential area from changing to a higher land usage probably accounts for this result.





SUMMARY OF DAMAGES AND ENHANCEMENTS BY THE LAND USE STATUS IMMEDIATELY AFTER THE RIGHT-OF-WAY TAKING

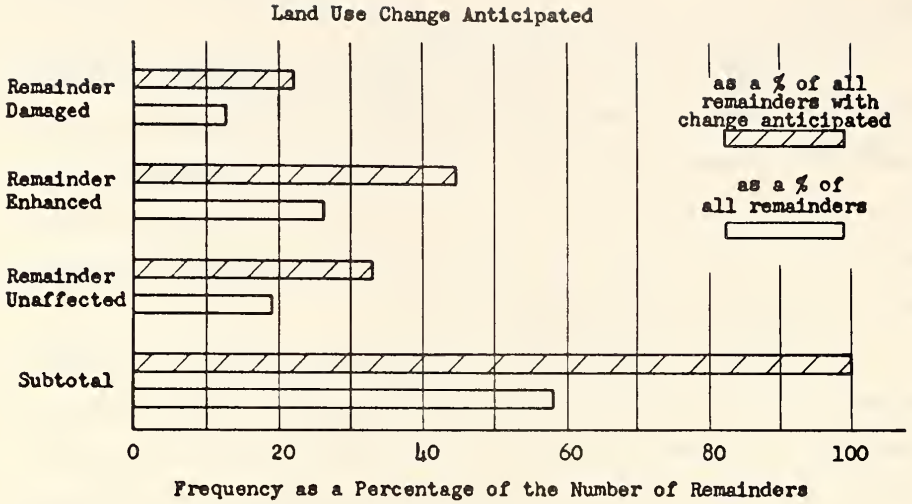
FIGURE 10

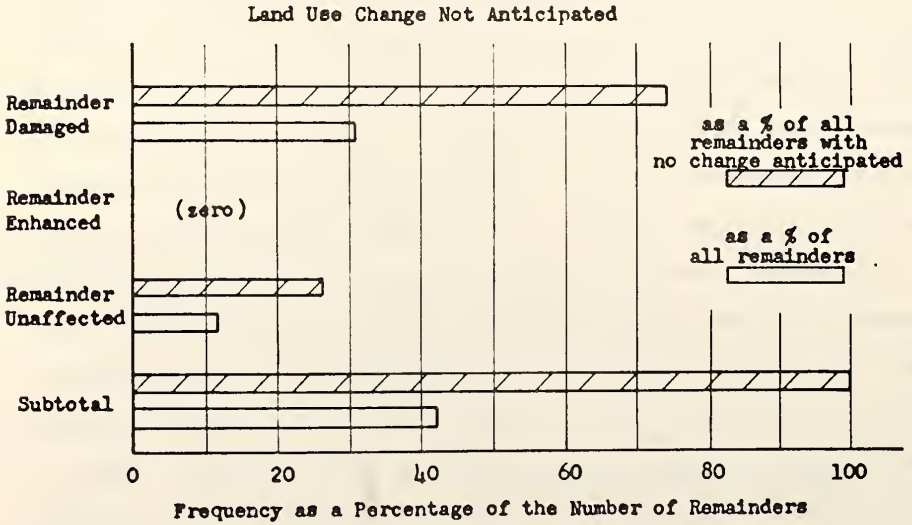
The very low percentage of vacant parcels that were enhanced is perhaps surprising. This low percentage of enhancements is probably due to the fact that most of the residuals that were left vacant had been developed prior to the right-of-way taking. These remainder tracts were often of an odd shape, quite small, and/or landlocked. There was some indication that tracts which were vacant prior to the taking were enhanced.

The frequency of enhancements or damages on the basis of an anticipated change in land use, as of the date of sale, is presented in Figure 11. This classification was prepared because it was suspected that the buyer bases the price which he is willing to pay on his anticipated use of the property rather than on its existing use.

The most significant observation is that in every case where the residual was enhanced, the grantee anticipated utilizing the tract for some purpose other than its existing use. Conversely stated, there were no enhancements observed where the buyer did not anticipate a change in the land use when he purchased the property. The very high frequency of damages when there was no change in land use contemplated by a subsequent buyer is also noteworthy.

Admittedly, these data will be difficult to use in the appraisal process inasmuch as it requires the ability to estimate accurately subsequent land use. However, continued research of the case study type might be expected to produce a sufficient amount of information on the particular circumstances which lead to a subsequent change in land use. This may permit a highly accurate estimate of a particular remainder's probable future use. For the present, however, it suggests that the probable uses to which a residual might be put should be considered.





SUMMARY OF DAMAGES SUSTAINED AS RELATED TO THE ANTICIPATED LAND USE AT THE TIME OF SALE

FIGURE 11

Summary of Stated and Inferred Sale Prices

In the course of conducting this research, the sale prices were obtained or estimated for a number of parcels by various methods. A summary of these is given in Table 30. These data show a very good agreement between the total stated price and an inferred price based on the U. S. Revenue Stamps plus the unpaid balance of any mortgage assumed and the inferred price based on the amount of Indiana Gross Income Tax paid.

TABLE 30

SUMMARY OF STATED AND INFERRED SALE PRICES

Total of Sale Price (79 tracts)	
Inferred from U. S. Revenue Stamps	$440,750 to $478,800
Stated	$478,200
Total of Sale Price (13 tracts)	
Inferred from Gross Income Tax	$145,075
Stated	$145,375

There were only four cases where the range in inferred price based on the U. S. Revenue Stamps did not bracket the stated sale price. In general, the stated price agreed more closely with the upper inferred value than with the lower. Thus the summation of the upper limit of the sale prices inferred from the revenue stamps is an accurate estimate of the total of the sale prices for a collection of properties. It is also a reliable estimate of the sale price of an individual parcel when a sale price is sufficiently large so that a possible error of $500 becomes relatively unimportant.

There was only one instance where the sale price inferred from the amount of gross income tax paid did not equal the stated sale price. This would indicate that an inferred price from the gross income tax paid is a reliable estimate of an individual sale price when a stated sale price is not available.

CONCLUSIONS

The following conclusions are based on the data contained in the case studies which resulted from this research and on various analyses of these data. They are applicable to highway right-of-way acquisitions obtained in Indiana in the period 1955 through 1961.

1. For the State of Indiana as a whole, the sale price of residual parcels resulting from highway rights-of-way acquisitions was considerably greater than the apparent 'after' value ('before' value less the amount of the settlement).

   The total of the sale prices of residuals resulting from a taking on a primary or secondary project exceeded the total of the 'after' values by over 35 percent and was even slightly in excess of the total of the 'before' values.

   On interstate projects, the total sale price of the residuals exceeded the apparent 'after' value by nearly 20 percent; but, it was considerably below the total of the 'before' values.

2. Of the parcels on primary and secondary projects that sold by 1962, about 50 percent of the owners received a sale price that was significantly in excess of the apparent 'after' value; on interstate projects, nearly 30 percent

received a sale price that was significantly in excess of the 'after' value. However, there were relatively few residuals that sold for considerably more than the apparent 'after' value, 3 out of 16 for primary-secondary projects and 3 out of 30 for interstate projects.

Although the total sale price exceeded the total 'after' value, there were a number of residuals which sold for significantly less than the 'after' value -- about 10 percent of the residuals on the primary and secondary routes and 20 percent on the interstate projects. Relatively few cases, however, were found where the remainder sold for considerably less than the 'after' value, 1 out of 16 on primary-secondary and 1 out of 30 on interstate projects.

3. Major enhancements occurred in relatively few cases (3 out of 16 for primary-secondary and 2 out of 30 for interstate projects) and in all cases were for properties located near urban areas and at intersections or interchanges of major highways with limited access on the more important of the two intersecting facilities.

4. The total amount paid for damages to residual parcels exceeded those sustained. On primary and secondary routes the dollar value of damages paid exceeded those sustained by 15 percent. On interstate routes the

total excess payment was nearly 30 percent of the total damages sustained. There was, however, considerable inequity to the several property owners.

The damages paid exceeded those sustained in nearly 50 percent of the cases on primary and secondary routes and in over 40 percent of the cases on interstate routes. However, 20 percent of the owners of residual tracts on primary and secondary projects sustained more damages than they received. On interstate projects, about 40 percent of the owners sustained more damages than were paid.

5. Considerably more damages were paid for landlocking and for separation of properties than were sustained. For landlocked tracts, the total of the damages paid was about double those sustained. On the average, damages paid were equal to 80 percent of the residual value while the average of those sustained were slightly over 35 percent. For separated parcels, the damages paid were about 3.5 times those sustained. The total damages paid were over 30 percent of the total value of the separated tracts; the total damages sustained by all such tracts were less than 10 percent.

6. The limited data available indicate that damages paid due to reduction in size exceeded the damages sustained.

The damages paid were significantly larger than those paid in over one-half of the cases. Slightly less than 20 percent of the remainder value was paid in damages while slightly over 10 percent was sustained.

7. A change in land use was anticipated by the buyer in every instance where the residual was significantly enhanced. There were no enhancements observed in any of the cases where no change in land use was anticipated by the grantee when he purchased the property.

8. There was no statistically significant difference in the median time that had elapsed between the time of the appraisal and the date of sale for residuals that were enhanced, damaged, or experienced no change in value.

9. The total of the upper limits of the individual sale prices inferred from the amount of U. S. Revenue Stamps recorded with each deed, plus the balance of any mortgage assumed, is a reliable estimate of the total of the actual sale prices for several properties. It is also an adequate indication of an individual sale price when the amount of the sale is large enough to render a possible error of $500 unimportant. A sale price inferred from the amount of Indiana Gross Income Tax paid is an accurate estimate of the sale price of an individual property.

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APPENDIX A

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INTRODUCTION TO THE CASE STUDIES 101

The following numbered case studies comprise Appendix A of this report.

CASE STUDY NUMBER 3 31
14 32
15 33
16 34
17 35
19 36
20 37
21 38
22 39
23 40
24 41
25 42
26 43
27 45
28 46
29 47

TABLE OF CONTENTS (continued)

CASE STUDY NUMBER	48	56
	49	57
	50	58
	51	59
	53	60
	54	61
	55	62

The above case studies were originally contained on pages 110 through 362. These case studies are bound separately in an expandable binder so that other case studies, not a part of this analysis, might be added and the total collection of case studies maintained in consecutive order. This will also facilitate the substitution of any case studies that might be up-dated and revised in the future.

INTRODUCTION TO THE CASE STUDIES

A total of 46 case studies resulted from the investigation of all remainder parcels involved in the randomly selected sample of right-of-way projects. These individual studies are included in this report because they constitute the data upon which the research reported here is based. It is also hoped that they will provide additional helpful information as individual comparables to those individuals active in the appraisal profession.

These case studies are essentially the same as those of the same numbers which were issued periodically by the Joint Highway Research Project of Purdue University during 1961 and 1962. Certain desirable editorial changes and corrections, however, have been made in some of them. Certain symbolism has also been added to help the reader orient the photographs included in some of the case studies. To this end, the following symbol has been utilized. The position of the arrow in each figure represents the

approximate spot from which an accompanying photograph was taken, and the direction of the arrow indicates the orientation of the camera at the time of exposure. The number shown inside each arrow refers to the figure number of the particular photograph of interest.

It will be noted that the highest numbered case study contained herein is 62, and that the case study numbers are not consecutive. This has occurred because a number of case studies were prepared and issued in conjunction with other highway impact research being conducted at Purdue University. The right-of-way projects from which these latter case studies evolved were

not a part of the randomly selected sample for this research and are not included in this analysis.

The date which appears on each case study is the date the case study was completed and issued by Purdue University. In some cases, the original study was later revised into a standard format. In these cases, the word revised precedes the date of reissue.

TABLE A1

INDEX OF CASE STUDIES BY THE TYPE OF RIGHT-OF-WAY PROJECT

Interstate		Primary	Secondary
3	56	14	19
15	57	16	23
25	58	17	27
26	59	20	41
28	60	21	45
29	62	22	46
31		24	47
32		55	
33		61	
34			
35			
36			
37			
38			
39			
40			
42			
43			
48			
49			
50			
51			
53			
54			

TABLE A2

INDEX OF CASE STUDIES BY THE TYPE OF AREA

Urban	Urban Fringe	Rural
3	14	15
23	16	19
25	17	22
27	20	24
28	21	26
34	31	29
45	32	33
46	41	35
54	42	36
61	43	37
	49	38
	53	39
	55	40
	56	47
	57	48
	58	50
	59	51
	60	
	62	

TABLE A3

INDEX OF CASE STUDIES BY THE LAND USE BEFORE THE RIGHT-OF-WAY ACQUISITION

Agricultural	Commercial	Residential	Vacant
14*	17	3	19*
15		14*	23
16		17	24*
21		19*	29
25*		20	56
26		22	59
28*		24*	
33		27	
35		25*	
36		28*	
37		31	
38		32	
39		34	
40*		40*	
44		42	
50		43	
51		49	
		53	
		54	
		57	
		58	
		60	
		62	

* Denotes parcels used for two or more uses prior to acquisition

TABLE A4

INDEX OF CASE STUDIES BY THE TYPE OF REMAINDER

Separated (1)	Isolated (1)	Divided (2)	Landlocked (3)
3	12	19	15
17	22	24	16
20	23	28	31
21	26	29	33
25	42	29	37
27	53	32	43
34	54	33	50
36	57	35	
41	59	38	
45	61	39	
46		40	
48		47	
49		51	
56		55	
58			
60			
62			

(1) Definitions used are those given in Manual For Highway Severance Damage Studies, Bureau of Public Roads, September 1961, pages 37 and 38. Remainder is a single tract having access via a public road. Separated remainders have improvements located thereon; isolated are unimproved.

(2) Remainder was divided into two tracts by the right-of-way taking. Both tracts may be classified as separated or isolated or one separated and the other isolated.

(3) These remainders have at least one tract that does not have access via a public road. There may be other tracts which may be classified as separated or isolated.

TABLE A5

INDEX OF CASE STUDIES BY THE TYPE OF DAMAGES PAID

Cut or Fill	Landlocking	Proximity	Reduction in Size	Restriction of Access	Separation of Parcel	Shape
19	15	19	17	20	28	21
25	16	20	22	21	29	24
32	31	27	23	60	32	25
33	37	32	29		38	26
42		34	34		39	28
41		38	38		40	29
47		41	49		47	39
49		45	53		55	40
50		46	54			
58		47	61			
60		49				
62		58				
		62				

TABLE A6

INDEX OF THE CASE STUDIES BY ACCESS CONTROL
IN THE VICINITY OF THE REMAINDER

Full Control	Partial Control	No Control
15	14	3
16	20	17
26	21	19
28	22	23
31	25	24
33	42	27
34	45	29
35	46	32
36	49	47
37	55	54
38	60	58
39	62	59
40		61
41		
43		
48		
50		
51		
53		
56		
57		

TABLE A7

INDEX OF CASE STUDIES BY MAJOR ACCESS POINTS

Remainder Located Adjacent to	
Interchange	Major Intersection
3	17
14	20
25	21
35	22
36	55
38*	
39*	
51	
53	
57	

* Interchange was not constructed at the time the highway was constructed but is programed for a later date.

APPENDIX B

APPENDIX B

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Outline of Recommended Procedures for Data Collection	374
Examples of Case Studies for Release to the General Public	376

APPLICATIONS TO CONTINUING STUDIES

At the outset of these studies, it was anticipated that the investigation of properties involved in a right-of-way taking would be continued after this study, on an expanded scale, by an appropriate agency within the state highway commission. In this respect, the research was also viewed as a pilot study to develop and outline the data collection procedures that would be suitable for subsequent full-scale studies of remainder parcels. These specific procedural objectives of the study were:

- for projects already constructed, what is the year prior to which case studies are not worthwhile?
- what is the most efficient way to obtain the data necessary to prepare a case study in a text format and also in the form desired by the Bureau of Public Roads.
- what is the cost of obtaining these data and what personnel would be required to conduct full-scale studies?

Cost of Data Collection

In order that the expenditures necessary to conduct the full-scale studies of remainder parcels might be estimated, itemized costs of data collection and report preparation were maintained for twenty of the right-of-way projects involved. These projects were the last ones to be investigated so that the procedures were somewhat routine by this time. No specific attempt was made to randomize the order in which the projects were investigated. Rather, the projects in the same general area were, for the most part, studied at the same time so as to minimize the time and travel necessary. However, it is believed that these data are sufficiently representative to indicate the magnitude of the problem of investigating additional projects.

The outline shown in Figure B-1 was utilized to record the cost information with respect to the various cost items. The amount of labor involved was recorded by the number of hours spent so that an estimate of the personnel required for future studies might be made. A dollar value for this time was not assigned because it is of secondary importance; also, the wages of students employed on a part-time basis are not representative of the costs associated with full-time employees. Thus the time spent was classified according to professional and subprofessional levels to aid in the analysis.

The total cost of making the initial check for the sale of the residuals for the twenty projects was as follows:

travel, 3,100 miles @ 6¢ =	$186
per diem, 9 1/2 days @ $10 =	$95
time, traveling	62 hours
checking for transfers	91 hours

Assuming that these figures are representative of all projects, the estimated cost of checking the 66 projects of this study using the same procedures is:

travel	$620
per diem	$310
time, total	505 hours

The actual costs associated with this study were most probably greater as the procedures initially used were somewhat less efficient than those employed in checking the twenty projects on which the costs were recorded. However, they should be representative of the expenses that would be involved in collecting similar information in the future.

ITEMIZED COST STATEMENT FOR CASE STUDIES

R/W Project #_____

Initial check for transfer of title to residual tracts: Subtotals

travel: _____ miles @ 6¢/mile = $_____

per diem: ___ days @ $10/day = $_____ $_____

time: _____ hours travel

_____ hours checking for transfers _____ hours (S)

no. of parcels checked _____

Obtain data from R/W files ISHC

travel: _____ miles @ 6¢/mile = $_____ not applicable

time: _____ hours to R/W

duplication: _____ pages @ 25¢/page = $_____ Division, ISHC

no. of parcels: _____

Interview property owner, travel distances, etc.:

travel: _____ miles @ 6¢/mile = $_____

per diem: ___ days @ $10/day = $_____ $_____

time: _____ hours travel

_____ hours to interview _____ hours (P)

FORM USED TO ITEMIZE COST DATA

FIGURE B-1

Obtain control data:

travel: _____ miles @ 6¢/mile = $_____

per diem: ___ days @ $10/day = $_____ $_____

time: _____ hours travel

_____ hours to verify _____ hours

no. of time periods for which data necessary _____

Preparation of reports (totals for all reports)

completion of Form 1030: _____ hours

text report

draft copy: _____ hours (P) _____ hours (S)

drafting: _____ hours (S)

typing: _____ hours (S) _____ hours (P)

duplication: _____ pages @ ____ ¢/page = $_____

no. of photographs used: _____ @ $____/page = $_____ $_____

no. of case studies prepared: _____

Total Expenditures

Supplies & Servies $ _____

Time, subprofessional (S) _____ hours

Time, professional (P) _____ hours

FIGURE B-1 (continued)

It will be observed that the major part of the expenses are associated with travel. These costs suggest that it might be more efficient to have a local abstract office make the initial check for any sales of the residuals and to supply a copy of the deed for each tract sold. The following summary of calculations indicates that a payment of nearly $6.00 per deed obtained from an abstract company could be justified.

total number of recorded sales of a residual or part thereof for all 66 sample projects = 317

estimated total cost of obtaining data by method used in this research:

travel and per diem	$ 930
labor, 505 hrs @ $2 per hr =	1,010
Total	$1,940

Hence, the cost per deed of land sold was approximately $6.10.

Because a research branch within the highway department would have ready access to the right-of-way files, only the time spent (44 hours) in obtaining the necessary data from these files is pertinent to full-scale studies.

For 19 of the 20 projects in the cost sample, one or more residuals, or parts thereof, were sold. In process of interviewing the grantee (or grantor) to verify the sale price, to measure the travel distance to the new facility and nearest trading center, to check visibility, etc. The following expenditures were incurred:

travel, 3,300 miles @ 6¢ = $198

per diem, 9 day @ $10 = $ 90

time, to travel from Lafayette and return 49 hours

to interview, etc., and local travel 115 hours

For those cases where it was necessary to obtain an estimate of the changes in the local real estate market between the time of acquisition and the date of sale, the collection of control data involved the following:

travel, 1,176 miles @ 6¢ = $69

per diem, 9 days @ $10 = $90

time, traveling = 21 hours
collecting and verifying control data = 113 hours

These control data were generally obtained as part of the same trip to verify the sale price and to collect other data. The number of miles traveled between Lafayette and the subject's locale as well as the number of hours in transit were assigned to the previous cost heading -- "Interview property owner, travel distance, etc.". Consequently the above figures indicate only the additional expenditure made to obtain and verify the control data.

The total time spent in obtaining and verifying the data for the residuals sold and the control data was 342 hours, including travel time. This expenditure of time produced data associated with 39 remainder parcels for which a case study resulted.

In addition to the cost of obtaining the information, the following costs were incurred in preparation of the 30 reports:

drafting	308 hours
completion of form PR 1030	105 hours
preparation of text reports;	
draft copy	126 hours
typing	62 hours

On this basis, it is estimated that more than 675 hours of professional labor were consumed to collect data and complete the text and form PR 1030

reports and that 435 hours of subprofessional and clerical help were consumed by drafting and typing for the 46 case studies reported herein.

In addition to the above cost classifications, there were considerable expenditures of time for such miscellaneous items as supervising the preparation of illustrations, proof reading, duplication of reports, ordering supplies, picking up and returning vehicles to the motor pool, discussions concerning the collection of data and general conduct of the research, etc. that were not recorded. In other words the costs recorded were those for "100 percent efficiency", and time that was inefficiently used was not recorded. Therefore, the time estimates given in the following section for full-scale studies are minimal.

Estimate of Full-Scale Study Requirements

On the basis of the 1,258 residuals involved in the 31 interstate projects studied, it is estimated that the 99 interstate projects placed under contract prior to 1 January 1962 (including the 31 investigated) involve approximately 4,000 residuals. It is expected that 100 of these (2.4 percent of 4,000) would have resulted in a case study in 1962. Similarly, for the projects on primary and secondary routes, it is estimated that the 430 projects placed under contract between 1 January 1955 and 1 January 1962 involve some 12,200 residuals and that 185 (1.5 percent) of these would have resulted in a case study in 1962.

Thus, it is estimated that a total of about 280 case studies would have been produced if all right-of-way projects between 1 January 1955 and 31 December 1961 had been investigated in 1962. However, complete appraisals of the 'before' value were not generally made prior to 1958. Investigation

of these projects is judged to be not worthwhile because of the total time invested to obtain a single case study or, perhaps more often, no case study at all. Also, the change in appraisal procedures since then probably reduces their value because a substantial difference is apparent between appraisals made in 1958 and 1959 and those made in 1960 and 1961. Therefore, it is recommended that the study of residuals resulting from projects on primary and secondary routes be limited to those placed under contract after January 1960.

A similar argument with respect to the quality of appraisals can of course be made concerning interstate projects. However, it may prove to be interesting as well as valuable to be able to make an analysis at some later date concerning the entire Interstate System in Indiana. Therefore it is recommended that all residuals resulting from taking for an interstate highway be studied.

If all interstate projects plus the projects on primary and secondary routes during 1960 and 1961 are to be investigated, it is estimated that a total of about 180 cases, including the 46 herein reported, would be produced. This is the estimated total number of parcels that would produce a case study at this time (January 1963), this is, so to speak, the current "back-log" of studies.

To evaluate the total magnitude of the job, the additional case studies that would develop from the sales of other residuals during 1963 must also be considered. On the basis of the sales of residuals involved in projects for the year 1961, a total of about 30 case studies should result by the end of 1963 from projects placed under contract in 1962. The numbers of additional case studies that might develop from projects placed under contract prior

to 1962 would perhaps be 70. Assuming that all remainder parcels are to be investigated, the total number of additional case studies that might be anticipated to be completed or initiated in 1963 are summarized below:

	Project Date	Estimated Case Studies
estimated current "back log":		
interstate	1957-1961	65
U. S. and State marked routes	1960-1961	70
estimated to develop in 1963:		
interstate	1957-1961	40
primary and secondary routes	1960-1961	30
interstate	1962	15
primary and secondary routes	1962	15
Additional case studies		235
Potential to January 1964 Case studies herein reported		46
Total Potential Case Studies to January 1964		281

The calculations in the previous section indicate that it would be less costly to obtain a copy of the deed for a residual or portion thereof sold. Therefore, the following discussion of the staff necessary to investigate all right-of-way projects will concern the collection and verification of data on the subject property and control parcels and the preparation of the required reports. It is of course assumed that the 66 projects investigated and the 46 case studies resulting are representative of other projects.

The estimated absolute minimum expenditures required to investigate all right-of-way projects to yield the estimated 235 additional case studies are:

to obtain and verify information on subject properties and control parcels:

travel and per diem	$2,700
time	1,750 hours

to prepare reports:

form PR 1030 and draft of text report	1,280 hours
drafting and clerical	2,220 hours

Thus a minimum of some 3,000 hours of professional labor would be required to collect the necessary data and prepare the required reports. In addition, considerable time would be consumed in obtaining the names of the owners of the residual tracts from the right-of-way files and in contacting the several title companies that would supply the deeds for the residuals sold. Additional time would be needed for supervising the preparation of illustrations and reports, completion of travel and per diem vouchers, etc.

The collection of more detailed control information is also recommended; this would add considerably to the total time required. Also, it is most desirable that machine data processing for the summarization and analysis of data be established at an early date.

On the basis of a 40 hour week and 49 working weeks per year, two men will probably be required on a full-time basis to collect data on the subject properties and control parcels and prepare the PR 1030 reports. A third individual would probably be required to prepare the text reports, write the programs concerned with the machine processing, and analysis of the data collected. It is recommended that one individual have the primary responsibility for the conduct of the studies and devote all his time to these studies.

The other two persons should be staff appraisers assigned to the research on a rotating basis of one or two months at a time. After the initial 12 to 18 months, two individuals - the person in charge of the studies and one staff appraiser - should be sufficient unless the estimate of the number of case studies that will develop proves to be too low.

Outline of Recommended Procedures

In order that a sizeable number of case studies might be compiled within the shortest possible time, it is proposed that all remainder parcels created by a highway right-of-way taking be studied. This will supply both the staff and fee appraiser with the maximum amount of data at an early date. The procedure outlined below is directed towards this end. It assumes that the studies would be continuing and that standing agreements would be established with various abstract companies to supply certain information.

1. Identify the right-of-way project to be studied and determine which parcels were involved in a partial take.
2. Submit the names of the property owners together with the location of each parcel to an abstract company with which a service agreement has been made. This company will then search for changes in title to the remainders and supply a copy of the deed for each transaction concerning a residual or a portion thereof.
3. Secure the details concerning the residuals which have been sold from the right-of-way files. It is recommended that copies be made of the more pertinent information as it is often times very desirable to have this data when verifying the sale price and collecting the other necessary information in the field.

4. Prepare to visit the remainder and obtain information necessary to complete the required reports. In this respect, the investigator should thoroughly familiarize himself with the data available in the right-of-way files as well as the chain of title of the residual, including the number of acres involved and inferred sale price. In many cases, this will permit him to spot apparent discrepancies and to clarify them in the course of the interview(s). He should also complete insofar as possible the forms shown in Figures 2 and 3 of the main body of this report.
5. Determine the zoning before and after the acquisition from the appropriate agency. Determine if any changes in zoning have been petitioned as well as if the change was granted and, if so, the date.
6. Visit the remainder parcel. Interview the grantee(s) (or grantor) to verify the sale price, determine the anticipated land use when the parcel was purchased, changes made in the property, etc. Determine the land use of the date that visit was made as well as the distance to the nearest trading center, visibility of the old and new highways, elevation, nearest access point to the new highway, and take photographs.
7. For those residuals where there is doubt as to the stability of real estate prices between the time of acquisition and the date of sale, collect the necessary control information.
8. Complete the required report on the text format and on form PR 1030.

If neither the grantee nor the grantor can be contacted on the initial trip to visit the residual and the information is not available from another source such as the realtor or attorney handling the property, it is recommended that a return trip be made. Such trips can very often be accomplished in conjunction with a trip to investigate residuals resulting from other projects in near by counties. An attempt to verify a very limited number of sale prices by letter was found to be completely unsuccessful although the property owner gave the information quite freely on a subsequent interview. Therefore, the use of a letter in trying to verify a sale price where the grantee, grantor, or other reliable source could not be contacted is not recommended.

It is recommended that step 7 when required, not be undertaken until step 6 has been completed. The reason for this is that in a number of instances, the residual does not produce a case study. In this case, the time expended in collecting data for step 7 is wasted and the amount of time consumed by this step can be considerable.

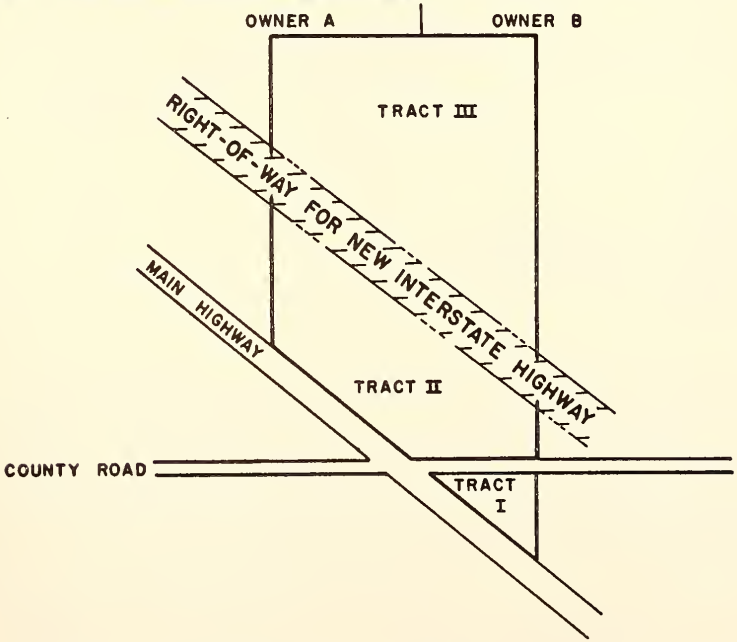
Examples of Case Studies for Release to the General Public

As explained in a previous section of this report, great benefit might be obtained through a continuing release of summaries of individual case studies. The following are examples of the information that might be contained in such news releases and are adapted from two case studies contained in Appendix A.

Report Number 1

"Property Taken For An Indiana Highway Improvement"

The main portion of the farm shown below was divided into two tracts by the construction of an interstate highway in Indiana. Tract III containing 49 acres was left landlocked (without access from a public road) by the construction of this highway and was later sold to one of the two property owners (A and B) who owned adjacent land.



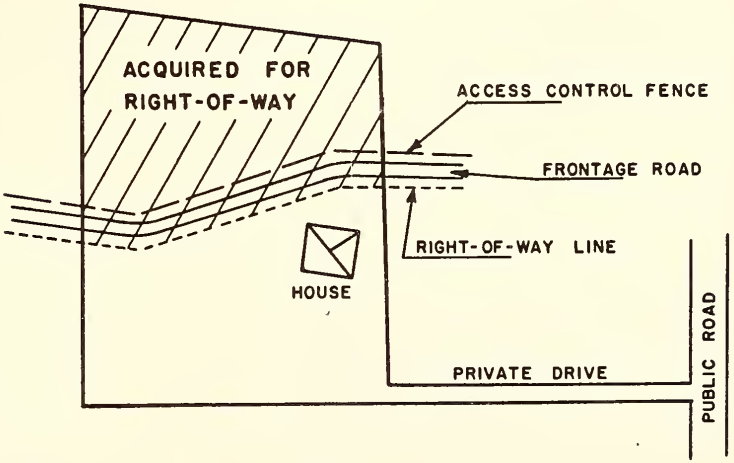
Value of Tract III at the time of sale if landlocking had not damaged property.	$18,400
Sale price	17,500
Actual damages to Tract III due to landlocking	$ 900

In this instance the landlocked tract was damaged only $900 as compared to the $14,600 which were paid for landlocking damages to this tract.

Report Number 2

"Property Taken For An Indiana Highway Improvement"

This property was a 2.2 acre parcel on which a two-story house was situated and is located near a medium sized Indiana city.



In 1959 the State of Indiana acquired approximately one-half of the land on which the house shown above was located for the construction of a new four-lane highway and paid $6,000 in proximity damages relative to the house. The value of the property before and after the highway commission's purchases of the necessary right-of-way was:

Value of the property before the highway acquisition in May 1959	$19,750
Payment to the property owner in May 1959 (including the $6,000 in damages)	11,050
Apparent value of the remaining property	$ 8,700
Sale Price of the remaining property in August 1959	13,500

In this instance the remaining property sold for $4,800 more than the apparent value of the remaining property. The actual proximity damages which resulted to the property were $1,200 compared to the $6,000 which was paid.